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The Association of Otolaryngologists of India
West Bengal

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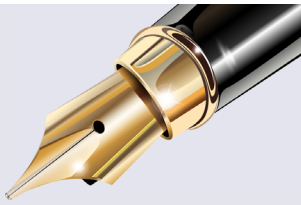
From the Desk of the Editor



Surgical outcome has been progressively refined by technological advancements and innovations but a surgeon's greatest asset remains knowledge of the human anatomy, a subject which has remained relatively unchanged albeit intricately evolving. Galen's information from animal dissection evolved over fifteen centuries into Vesalius' accurate depictions from cadaveric dissection but only three centuries later, in 1858, Henry Gray and Henry Vandyke Carter revolutionised human anatomy with the inaugural edition of Gray's Anatomy, a book which continues to expand with our knowledge on the subject.

The field of otolaryngology expanded to incorporate a variety of interdisciplinary acivities as intricate knowledge helped surgical navigation through anatomical labyrinths. Functional aspects of organs were defined through meticulous research on microstructural and ultrastructural details of anatomy as the surgeons' trepidation was replaced by a respect for the integrity of anatomical structures. We have progressed from the days where Mosher, in 1929, described ethmoidal sinus surgery as an easy way of killing a patient to a time where basic ethmoidal sinus surgeries are done even by surgical residents under supervision. The focus in sinus surgery has shifted from a gross structural study to one of understanding the various drainage pathways and their normal anatomical variations.

The otoendoscope has added another dimension to the field of otology. Studies regarding the mucosal folds and the pathways of ventilation of the middle ear and the endoscopic anatomy of the region has enhanced the understanding and tackling of ear pathologies while the description of natural variations has enabled surgeons to avoid common pitfalls during ear surgery. Life-changing procedures like cochlear implants have also been made possible due to detailed anatomical knowledge.

In 1977, Hirano's description of the ultrastructure of vocal cords revolutionised laryngeal surgery and coupled with the progress of optical instruments, mirror-guided laryngeal surgery and stripping of vocal cords have been supplanted by function-preserving microscopic surgeries with microflap techniques. Head and neck oncology, with exhaustive descriptions of the complex anatomy of the concerned region, has gradually evolved from just radical dissection to a more conservative approach, efforts being made to maintain oncological safety with minimal deprivation of functional integrity.

In essence, anatomy has not changed; what has changed is our understanding of the subject. The realisation that surgical procedures should consider the functional aspects of anatomical structures and be suitably modified remains the mainstay of further progress in our complex field.

Dr Saumendra Nath Bandyopadhyay
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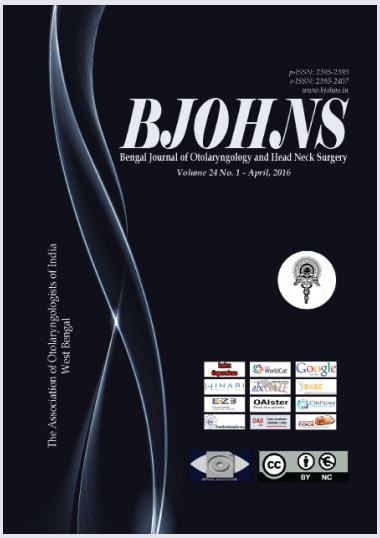

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The Contralateral Ear in Unilateral Chronic Otitis Media - Does it Need Reckoning?

Ramakrishnan Narayanaswamy,[1] Gaurav Awasthi[1]

ABSTRACT

Introduction

This comparative study aims to analyze findings and their significance in the contralateral ears of patients with unilateral Chronic Otitis Media (COM) and compare it with a control group of healthy subjects.

Materials and Methods

One hundred patients of unilateral COM and 100 healthy individuals were included in this study from Jan 2015 to July 2016. The findings were noted in the contralateral ears of patients with unilateral COM and 100 control subjects. The changes found in the contralateral ears were assessed statistically for significance.

Results

In 100 cases of unilateral COM, 58 patients had some abnormality in the contralateral ear. Myringosclerosis patches being the most common finding were seen in 29 patients followed by TM retractions seen in 28 patients. Prevalence of abnormal findings was found to be significantly higher in the squamous group as compared to the mucosal group. In 100 ears in the control group, only 11 % had positive findings. TM retractions were seen in 5 subjects (3 Attic and 2 Pars tensa retractions).

Conclusion

It can be statistically concluded that the disease of COM in one ear affects the contralateral ear slowly and silently. Hence both ears are affected as pairs and a slow pathological process continues behind an intact TM and kept hidden from the view unless it is actively sought for. Contralateral ears should also be actively followed up, in cases of unilateral COM in order to pick up disease harboring silently.

Keywords

Otitis Media, Unilateral; Contralateral Ear; Retraction; Myringosclerosis

Chronic Otitis Media (COM) is characterised as an inflammatory condition associated with a persisting perforation of the Tympanic membrane (TM) and chronic otorrhoea for more than 3 months. Histopathologically, COM is an inflammatory process of middle ear associated with irreversible tissue changes. This inflammatory process may be present even though the TM is intact and otorrhoea is absent – called as Silent Chronic Otitis Media (SCOM) by Paparella M. et al.[1] One of the theories for its pathogenesis is the 'Continuum theory' as proposed by Paparella in which Otitis Media is described as a sequence of events, initiated by an insult that would lead to a cascade of events. It begins with OME, progresses through AOM and leads to COM and/or its complications/sequelae. Patients with COM in one ear have a high chance of presenting with some degree of disease in the contralateral ear. The contralateral ear is the ear which is asymptomatic or the ear which has clearly less symptoms in the presence of an intact TM. Very few studies have evaluated this concept of silent COM. The aim of the study was to establish that patients with symptomatic unilateral COM can have subclinical/asymptomatic otological findings suggestive of COM in the contralateral ear.

Materials and Methods

A cross-sectional observational study was conducted

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in a multispecialty hospital in Eastern India from Jan 2015 to July 2016. All age groups were included. One hundred cases of strictly unilateral COM with or without cholesteatoma, with no history of otological complaints at all in the contralateral ear, were included in the study. Another 100 healthy subjects were taken from other non-otological patients in the ENT department for comparison, who served as control arm of the study. The findings which were reckoned to be of significance in the contralateral ear were retractions, myringosclerosis, thinning of TM and dimeric segments in TM, fluid/glue, granulations, cholesterol granuloma, mucosal thickening and polyps in middle ear cleft, behind an intact tympanic membrane (SCOM). All the findings were recorded by the same investigator, to eliminate any subjective bias.

Detailed otorhinolaryngological examination including otoscopic, otoendoscopic and otomicroscopic examination were done. Pure tone audiometry and tympanometry were done. HRCT temporal bone was done in cases with clinical findings of squamous disease only, to evaluate bony erosion due to disease, impending extra or intracranial complications.

Patients of COM with previous ear surgery in contralateral ear or history of trauma to the contralateral temporal bone and patients with congenital malformations in the contralateral ear were excluded from the study.

Analysis of variance and correlation coefficient with significance levels was calculated on the data collected using appropriate statistical tests. Data was entered into a Microsoft Excel spreadsheet and then analyzed by SPSS 20.0.1 and Graph Pad Prism version 5. Data has been summarized as mean and standard deviation for numerical variables and count and percentages for categorical variables. The median and the interquartile range have been stated for numerical variables that are not normally distributed. Student's independent sample's t-test was applied to compare normally distributed numerical variables between groups; unpaired proportions were compared by Chi-square test or Fischer's exact test, as appropriate. Each of these statistics can be used to carry out either a one-tailed test or a two-tailed test. Once a t-value is determined, a p-value can be found using a table of values from Student's t-distribution. If the calculated p-value is below the threshold chosen for statistical significance, then the null hypothesis is rejected in favour of the alternative hypothesis. p-value ≤ 0.05 was considered as statistically significant.

Results

Out of 100 cases of unilateral COM, 58 patients had some abnormality in the contralateral ear. Tympanosclerotic patches were the most common finding seen in 29 patients followed by tympanic membrane retractions seen in 28 patients. Many had multiple findings. (Table I). The age and sex distribution are as given at Table II and III respectively. Age and sex are not confounding factors.

Retraction of Pars tensa in the contralateral ear was statistically significant finding when compared between cases and control (Table IV) However, Attic retraction was found to be statistically significant when compared among the 2 subgroups (mucosal and squamous types of COM) (6%) and controls (2%). It was found to be more prevalent amongst squamous disease patients (Table V). Myringosclerosis patches were found in 35 contralateral ears in patients, whereas only 4 ears had TS patches amongst controls which was statistically significant. Dimeric segments were found in 21 ears in cases and only 4 ears in controls, which were statistically significant.

In 100 ears in the control group, only 11 % had positive findings. TM retractions were seen in 5 subjects (2 Attic and 3 Pars tensa retractions). Myringosclerosis patches were seen in 4 subjects and dimeric TM in 4 subjects with 2 patients having multiple findings.

Discussion

Paparella et al. revealed that the disease in one ear is linked to subclinical disease in the contralateral ear. He validated the Continuum theory and described Silent COM. He studied microscopic changes in the temporal bones of contralateral ears. He professed that COM in one ear slowly affects the other ear too.[1]

Similarly, some other authors too conducted studies

Table 1: Findings in the contralateral ear in cases.

MUCOSAL DISEASE (85 PATIENTS)	SQUAMOUS DISEASE (15 PATIENTS)
Myringosclerosis patches (26 patients) (30.6%)	Myringosclerosis patches (3 patients) (20%)
TM retractions (19 patients) (22.4%) - Pars tensa retractions (17 patients) - Attic retractions (2 patients)	TM retractions (9 patients) (60%) - Pars tensa retractions (5 patients) - Attic retractions (4 patients)
Dimeric segments (18 patients) (21.2%)	Dimeric segments (3 patients) (20%)
OME (2 patients) (2.4%)	OME (1 patient) (6.7%)

on this topic and came to similar conclusions regarding the affection of contralateral ear in cases of unilateral COM. Selaimen et al studied a total of 500 consecutive patients who had been diagnosed as having chronic otitis media with or without cholesteatoma.

They found that 376 (75.2%) had abnormalities in the contralateral ear.[4] Of 302 patients without Cholesteatoma 69.9% had abnormalities in the contralateral ear and of 198 patients with Cholesteatoma, 83.3% had abnormalities in the contralateral ear. Between 2003 to 2009, Kayhan et al. did retrospective medical chart reviews of 412 patients and found a high prevalence of changes in contralateral ears, however in contrast to Selaimen's study, they found similar prevalence in mucosal and squamous groups.[5] In 1996, Vartiainen et al. studied contralateral ears of 493 patients at the final follow up examination before surgery and found that in only 37.5% of the patients was the contralateral ear found to be normal, with atrophy of the pars tensa and tympanosclerosis being the most common abnormal findings followed by pars tensa and attic retractions.

The authors concluded that to improve the functional outcome of patients with chronic otitis media, earlier and more effective treatment of middle ear infections is needed.[6] In 2002, Barbara et al. studied the contralateral ears of patients with unilateral COM in 108 patients and found in 46.3% of patients the contralateral ear was found to have some abnormality.[7] Most common abnormal finding was retraction of tympanic membrane. In the study by Adhikari et al. out of 750 patients, in 68.4% of patients the contralateral ear was found to have some form of abnormality.[8] Rosito et al. studied 85 pairs of temporal bones microscopically in cases of unilateral COM and found a high prevalence of changes (91.8%) on the contralateral side.[9]

Table II: Variables assessed vide the master chart (Contd.)

GROUP	NUMBER	MEAN	SD	MINIMUM	MAXIMUM	MEDIAN	P-VALUE
Cases	100	38.89	13.6943	12	76	39	0.1906
Controls	100	36.44	12.6709	14	70	34	

(Statistically not Significant)

Table III: Distribution of sex in two groups

SEX	CASE	CONTROL	P-VALUE
Female	52	58	0.3192
Male	48	42	

(Chi-square value: 0.9920; P-value: 0.3192, Statistically not significant)

Table IV: Distribution of Pars tensa retractions (Sade[2] grading) in contralateral ear in two groups

PARS TENSA RETRACTION	CASE	CONTROL
No retraction	78	97
Grade 1	12	2
Grade 2	6	1
Grade 3	3	0
Grade 4	1	0
Total	22	3

(Chi-square value: 16.7771; P-value: 0.0021, Statistically Significant)

Table V: Distribution of contralateral attic retractions (Tos[3] grading) in two subgroups in cases and controls

ATTIC RETRACTION	MUCOSAL (85 EARS)	SQUAMOUS (15 EARS)	CONTROLS
No retraction	83	11	98
Grade 1	2	0	0
Grade 2	0	0	0
Grade 3	0	4	2
Total	2	4	2

(Chi-square value: 15.9783; P-value: 0.0003, Statistically Significant)

In a clinico-radiological study of the contralateral ear in acquired unilateral Cholesteatoma by Khalil et al. out of 50 patients with unilateral cholesteatoma and 25 control subjects with bilateral normal ears, 72% of the contralateral ears in cases showed signs of retraction pockets, granulation tissue or chronicity.[10] Ahmed et al. found abnormalities in 37% of the contralateral ears of 46 patients with unilateral COM.[11] All these studies by different authors from around the world are consistent with findings in our study.

The factors that affect eustachian tube functions on one side frequently have effect on the contralateral side too. (Figs. 1 and 2) We can thus infer that the disease of COM in one ear affects the contralateral ear slowly and silently. Hence both ears can be affected as a pair and a slow pathological process continues behind an intact TM and kept hidden from the view, unless it is actively sought for.

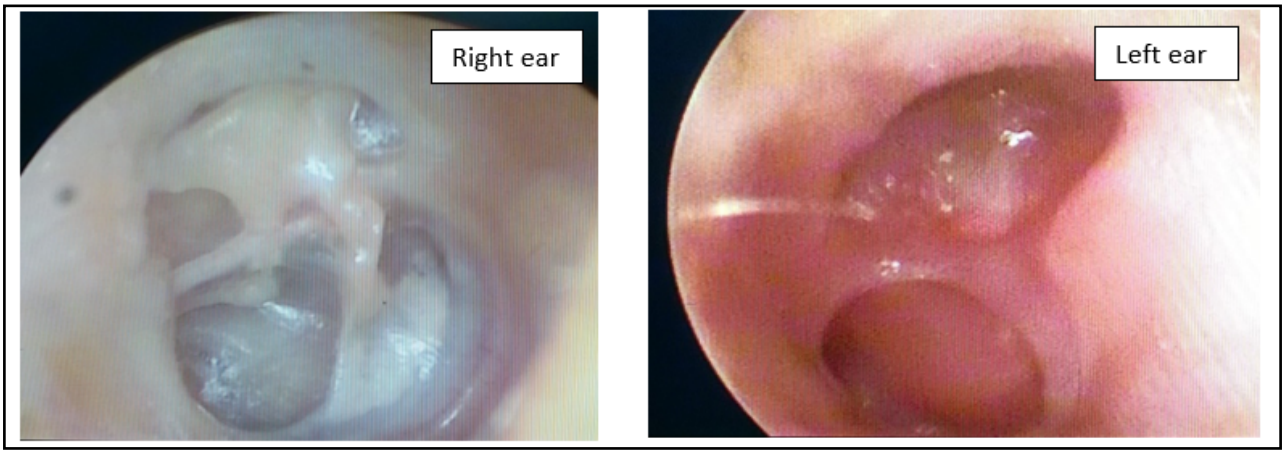

Fig. 1. Changes in the contralateral right ear are clearly evident in this picture with exposure of ossicles in the attic due to scutum erosion

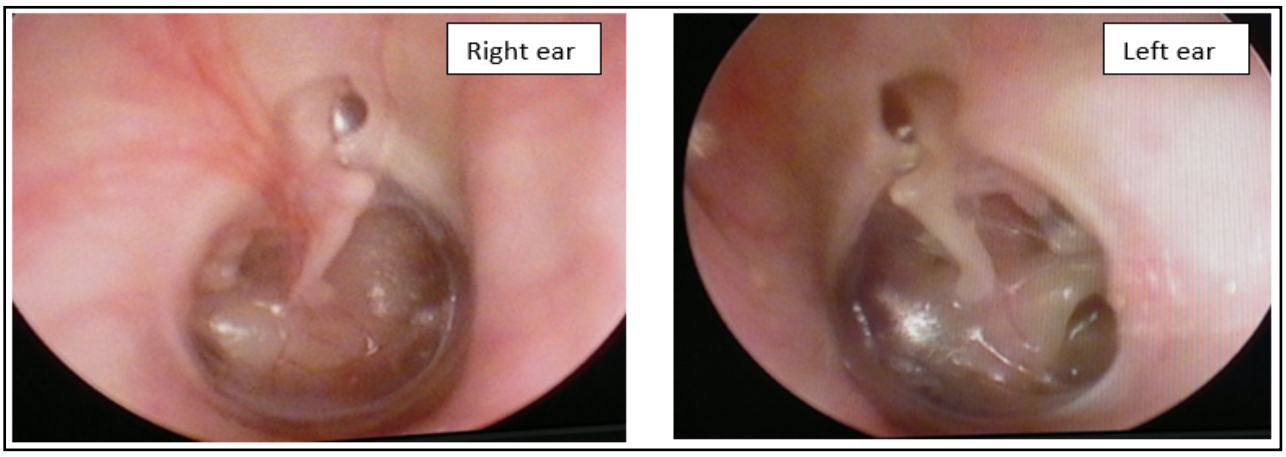

Fig. 2. Both ears showing scutum erosion and a thin TM plastered to promontory. In this case of Inactive Squamous disease, both ears have been affected to more or less equal extent. To begin with, patient presented with Inactive squamous disease (Left).

The changes seen in the contralateral ear applies more to patients with COM squamous disease, as these patients have more prevalence of abnormal findings including attic retractions. In one study the authors found improvement in the contralateral ear after operative treatment of the ear with COM.[12]

This is one step ahead in proving this theory. Hence the clinicians should treat not only the affected ear in COM but also need to follow up the contralateral ear very cautiously. This will go a long way in preserving the already compromised hearing of the patients and improving his/her quality of life.

Conclusion

Chronic Otitis media is a disease with very varied clinical presentation and disease in one ear has been sometimes found to be associated with subtle to gross changes without any symptoms, observed in the contralateral ear. These changes can eventually result in beginning of a gradual and chronic inflammatory process in the contralateral ear.

Therefore, it is imperative to exert caution in the clinical assessment of the contralateral ear. The contralateral ear warrants due respect and reckoning with regular follow-up.

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Epidemiological Profile of Foreign Body in Upper Aero-digestive Tract in a Peripheral Tertiary-Care Hospital

Amit Bikram Maiti,[1] Rabi Hembrom,[1] Rupam Sinha, [1] Satadal Mandal, [1] Mayur M Nair, [1] Somnath Patra [1]

ABSTRACT

Introduction:

Congenital deafness in a child is often missed. Several distraction tests have evolved over time to diagnose congenital deafness. Foreign body in upper aero-digestive tract leads to many complications including life-threatening ones to the patients. Its management depends upon type of foreign body and site of lodgement.

Materials and Methods

A descriptive study was conducted from March 2013 to February 2017 to determine the different components of the epidemiological profile of the cases of Foreign body in upper Aero-digestive Tract (UADT) and its management principle. Total 192 patients were selected for this study. These patients underwent different procedures for foreign body removal and post-operative notes were taken for data analysis to note the epidemiological pattern.

Results

A total of 192 patients were included in the study. Epidemiological data were derived and analyzed comprehensively to present the different profiles.

Conclusion

Fish bone was found to be the commonest foreign body in upper aero-digestive tract, followed by coin and meat bone. Foreign bodies are commonly removed by Tilley's forceps followed by Hypopharyngoscopy.

Keywords:

Foreign Bodies; Digestive Tract

Foreign body in upper aero digestive tract is a very common emergency encountered by ENT surgeons all over the world. Apart from nose and ear, pharynx and oesophagus is the next most common site for lodgement of foreign body.[1] Most of the ingested foreign bodies (80-90%) pass spontaneously on crossing lower esophageal sphincter.[2] But few (10-20%) become impacted during its passage through GI tract and requires operative intervention. Less than 1% requires surgery for removal.[3] In cases of sharp foreign bodies, common sites of impaction are palatine tonsil, base of the tongue, pyriform fossa etc. In case of blunt foreign bodies, sites of impaction are cricopharynx, upper one-third (25 cm from incisor teeth) of oesophagus. Beyond oesophagus other sites of obstruction are pylorus, duodenum and duodeno-jejunal flexure.

Blunt or smooth foreign bodies generally do not cause any harm and pass easily. But for sharp foreign bodies like fish bone, meat bone, denture, pin etc penetrate the intestinal wall followed by impending complications. Without treatment, complications like perforation, retropharyngeal and para-pharyngeal abscess formation, obstruction, oesophageal-aortic fistula, trachea-oesophageal fistula may occur. The common symptoms of the foreign bodies retained less than 24 hours are dysphagia, drooling of saliva, vomiting, gagging and anorexia. Respiratory symptoms like cough, stridor and chest pain may arise within minutes of foreign body entry into tracheo-bronchial tree; delayed complications like pneumonia may also occur.

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Radiological localisation of foreign body is an essential part of management. Antero-posterior and lateral X-ray of affected part is the basic radiological investigation performed. Barium studies should be used when there is suspicion of partial obstruction of oesophagus by radiolucent foreign body as complete obstruction of oesophageal lumen by foreign body may lead to aspiration of contrast material.[4] Positive findings on the esophagogram are irregularity in contrast medium column, deviation in expected course of oesophagus. Computed tomography scan and ultrasonography may be used as a tool for diagnosing radiolucent foreign body. Here we are presenting a study on different foreign bodies in upper aero-digestive tract admitted in our institution.

Materials and Methods

An institution based observational, descriptive, cross sectional study was done from March 2013 to February 2017 among 192 patients admitted in ENT inpatient department with definitive history of foreign body ingestion/inhalation; dysphagia/odynophagia following intake of food or radiologically detected foreign body. Cases where the foreign body passed below LES; severe mentally ill patients and infants below the age of 6 months were excluded from the study. The study aimed to determine the frequency of different types of foreign body along with their site of lodgement and the methods used for the removal of the same.

After admission, detailed history taking and clinical examination was done in every case. Soft tissue X-ray of neck (AP and lateral view) examination was done in almost every case to confirm the position of foreign body and whether it has passed through the oesophagus into the stomach. Apart from this, routine haemogram, X-ray chest, ECG was done for pre-anaesthetic fitness. After fitness clearance obtained from anaesthetist patients were taken to operation theatre for necessary intervention. Sharp foreign bodies like fish bone which were present in palatine tonsil or soft palate were easily removed under local anaesthesia. Two cases of coin which were lodged in cricopharynx were removed by Foley's catheter method. Rest of the patients were put under general anaesthesia and necessary procedures like Hypopharyngoscopy, Rigid Esophagoscopy, Bronchoscopy was done. We had no Flexible Endoscopic facility. So no foreign body was removed by flexible endoscopic procedure.

Based on above data, statistical analysis regarding types of foreign bodies according to age, sex, site of lodgement and procedure of removal has been performed.

Result

Total 192 patients were selected for this study. Ages of the patients ranging from 8 months to 84 years were included. Most common age group is 0-5 years (26.56%), followed by 6-10 years (11.97%). Incidence in age groups ranging from 11 to 30 years was found to be similar (interval of 5 years). (Fig. 1) Among 192 patients, 104 patients were males (54.16%) remainder females (45.83%).

Among all foreign bodies in upper aero-digestive tract, most common is fish bone-84 patients (43.75%). Apart from fish bone others include coin- 35 (18.23%), meat bone- 35 (18.23%), denture- 14(7.29%). Less common foreign bodies are meat bolus- 4 (2.08%), foreign body in bronchus- 5 (2.60%), button-type battery- 3 (1.56%). Least common things like cotton thread, rubber cover of TV jack, pen cap, tooth brush, ear ring (Fig. 2), hair pin, plastic cap together constitute the group 'others'-12 (6.25%) (Fig. 3).

In case of fish bone, majority were in palatine tonsil. Out of 35 patients who ingested coins, in 23 (65.71%) patients it was impacted in cricopharynx, remainder-12 (34.29%) were in upper third of esophagus. Meat bones commonly lodged in cricopharynx-10 cases (28.57%), followed by upper third of esophagus-17 (48.57%) and least in middle third-8 (22.85%). Among 14 cases of denture, 9 cases (64.29%) were in cricopharynx, 2 (14.28%) in upper third of esophagus, 3 (21.43%) in middle third. There are 5 cases (2.60%) of foreign body in bronchus-2 cases (40%) of pea in right bronchus, 2 cases (40%) of groundnut in left bronchus and 1 case (20%) of groundnut lodged at carina. (Table I)

Fish bones were removed with Tilley's forceps. In cases of fish bone lodged in the base of the tongue,

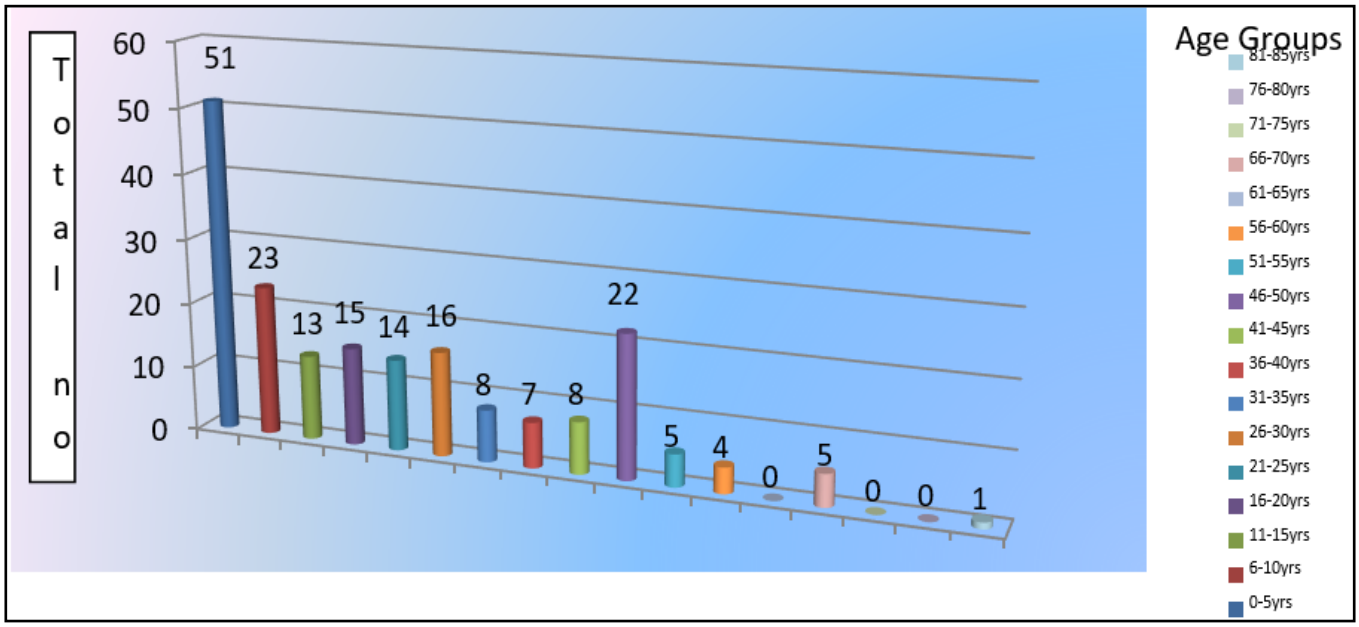

Fig. 1. Distribution of patients by age (N=192)

vallecula or pyriform fossa, direct laryngoscopy was performed. In majority of cases of impacted coin (65.71%) and denture (64.29%) hypopharyngoscopy was used for removal. Esophagoscopy was used in 34.29% of coin, 71.42% of meat bone and 35.71% cases of denture .

Discussion

Impaction of foreign body in esophagus leads to edema of mucosa and esophageal wall becomes weakened.[5] Sometimes esophageal peristalsis is not able to remove the esophageal foreign body. Long standing retention of esophageal foreign body may lead to perforation. So it should be removed as early as possible.

Fig. 2. Ear ring in Hypopharynx

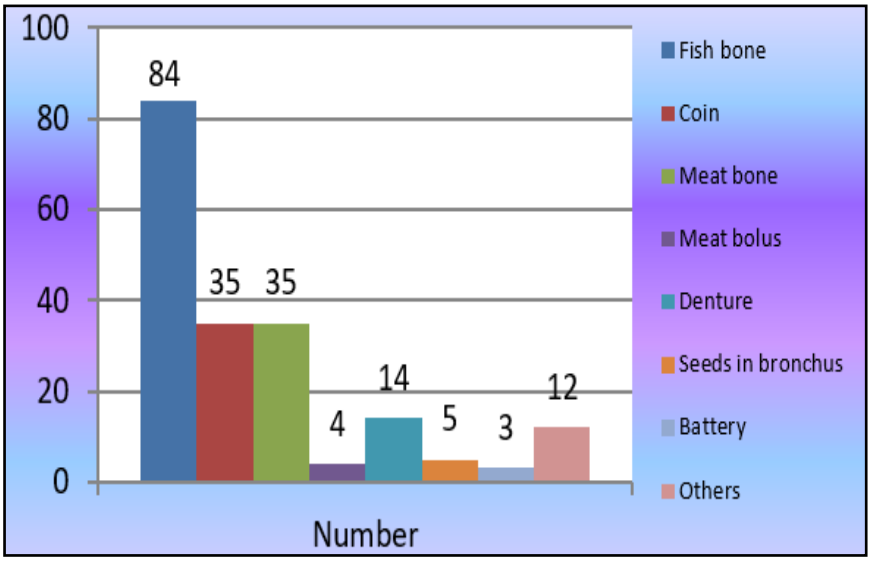

Fig. 3. Distribution of patients by type of foreign body (N=192)

Table I: Distribution of patients by site of impaction in aero-digestive tract (N=192)

ANATOMICAL SITE	NUMBER OF PATIENTS	PERCENTAGE
A. Foreign Body in Digestive Tract		
Tonsil	**43**	**22.4**
Base of tongue	**23**	**11.98**
Vallecula	**8**	**4.17**
Pyriform Fossa	**10**	**5.2**
Cricopharynx	**56**	**29.16**
Upper third of esophagus	**34**	**17.7**
Middle third of esophagus	**13**	**6.77**
B. Foreign Body in Airway Tract		
Bronchus	**5**	**2.6**

Many methods of foreign body removal have been developed like bougie, Foley's catheter, carbonated fluid or Papain, glucagon therapy, hypopharyngoscopy and esophagoscopy. Amongst these, hypopharyngoscopy and rigid esophagoscopy remain the most useful methods.

In our study, most patients belonged to 0-5 years of age(51 cases-25.56%). But in the study by Raza Muhammad et.al[6] 55% patients fall in this age group of 0-5 years. Ram Badan Sing et.al,[7] in their study showed that 62.9% of patients fall in the age group of 0-5 years. Most of the studies show pediatric age group is most commonly affected by foreign body in upper aerodigestive tract compare to other age group. This can be explained by explorative nature of children.

In this study there were 54.16% males and 45.83% females with M:F ratio 1.22:1. In the study of Sing et.al, the M:F ratio is 1.4:1 and in the study of Raza Muhammad et.al[6,7] the ratio of M:F is (1.32:1). Other relevant studies also support male preponderance. As most of the foreign bodies occur in children, and as male children are overactive than female, this probably explain the male preponderance.

Different types of foreign bodies found are Fish bone (43.75%), Coin (18.23%), Meat bone (18.23%), Meat bolus (2.08%), Denture(7.29%), Seeds in Bronchus (2.60%), Button-type battery (1.56%) and others (7.81%).

Fish bone is the commonest foreign body (43.75%) in upper aero digestive tract. This is because in this part of India fish is a part of the natives' daily diet. Study by Santosh Kumar Swain et al.[8] shows that the most common site of fish bone impaction is tonsil (31.6%), followed by base of tongue (20.4%), vallecula (18.4%) and pyriform fossa. But a study by L.C Knight and T.H.J Lesser[9] found that most common site of fish bone impaction is base of the tongue (53%) followed by tonsil (20%). In our study tonsil (51.19%) is the most common site.

Apart from fish bone, coin is the most common foreign body followed by meat bone. In our study, coin was present in 18.23% cases and meat bone in 18.23% cases. In the study by Prof.P.T.Deshmukh,[10] coin was present in 41.37% cases. Coins are seen most commonly

in children below 10 years of age group, because they have a tendency to put everything in the mouth. Coins commonly impacted in the cricopharynx (65.17%) and remainder in upper third of the esophagus (34.28%). Our study corroborate the findings of other studies that cricopharynx is the most common site of foreign body impaction.[11] Some other study also suggests that coin is the most common foreign body in digestive tract.[12] Chicken and mutton bone were present in 35 (18.23%) cases. Among 35 cases, 12 (34.28%) were at the level of cricopharynx, 14 (40%) in upper third of esophagus, 9 (25.71%) in middle third. It is found that most foreign bodies get impacted at the level just below the cricopharynx.

It may be due to strong peristaltic contraction of constrictor muscles of pharynx and weak propelling power of esophageal muscles.[13] We found 4 cases of meat bolus impacted just below cricopharynx or upper third of esophagus. This happen when a large bulk of meat is swallowed without proper chewing, who are aged people or having some kind of stricture in esophagus. There were 14 (7.29%) cases of impacted denture, mostly at the level of cricopharynx(64.29%). These patients were mostly elderly persons who had artificial denture. We received 5 (2.60%) cases of foreign body in airway tract (2 each in right and left and 1 in carina). Among 5 cases, 3 patients were below 10 years of age and 2 cases were above 60 years of age. In adults, foreign body in airway tract mostly get lodged in right bronchus. But in children, this right bronchus preponderance is not found.[14]

In children, left main stem bronchus is closer in size to right mainstream bronchus. The left main stem bronchus does not branch. We found 3 cases (1.56%) of button type batteries (coin-sized lithium batteries). In all cases batteries were removed within 6 hours of hospital admission. There is a common myth that button battery causes injury to esophagus by leaking its alkaline content. But leak usually do not develop, rather an electrical reaction takes place at the anode surface which creates tissue erosion.[15]

Apart from fish bone, among the rest 108 procedures, we performed hypopharyngoscopy in 65 (60.18%) cases, esophagoscopy in 41 (37.96%) cases. In 2 (1.85%) cases, coins were removed by Foley's catheter method. Hypopharyngoscopy was preferred because of its wider view compared to esophagoscopy and very less chance of injury to esophagus and other surrounding structures.

In esophagoscopy, there is always a chance of esophageal perforation, if not performed carefully. We used balloon extraction technique(Using Foley's catheter) for removal of coin in 2 cases where coins were lodged just below cricopharynx. The balloon extraction technique is a safe and effective technique alternative to rigid esophagoscopy for removal of selected esophageal foreign bodies in children.[16] This technique can be performed in an out-patient basis; does not require the use of general anaesthetic agents thereby preventing unnecessary anaesthetic hazards. Also the complications associated with esophagoscopy can be avoided.

Some literatures mentioned that some chemicals like papain and glucagon can be used for removal of meat bolus lodgement case. But risk of using papain is that it can digest the esophageal wall without digesting coins and bones. Glucagon is used to relax lower esophageal sphincter so that foreign body can pass. But glucagon does not relax a stricture or esophageal ring if foreign body is held due to that.

Conclusion

This study demonstrates that foreign body lodged in upper aero digestive tract occurs more commonly in children than adult. Hypopharyngoscopy with forceps removal of foreign body is more useful and safer method than rigid esophagoscopy. As the commonest type of foreign body encountered in children which requires removal under anaesthesia is coin; removal using Foley's catheter provides an alternative approach to the commonly used conventional techniques. In symptomatic patients, it should be diagnosed early and urgent removal should be done to prevent unnecessary complications.

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Fat Plug Myringoplasty Vs Trichloroacetic Acid Cauterization as Office Procedures for Managing Small Central Perforation

Kanchan Sandeep Dhote,[1] Priti Rakesh Dhoke, [2] Vivek Vishwas Harkare, [2] Nitin Vasant Deosthale,[2] Sonali Prabhakar Khadakkar [2]

ABSTRACT

Introduction:

In a series of day care office procedures, techniques like fat plug myringoplasty and Trichloroacetic acid (TCA) cauterization are becoming increasingly popular for managing small central perforations now-a-days[Office1] . These are minor, cost effective procedures and have success rates that match success rates of conventional tympanoplasty[Office2] . The aim of this prospective randomized controlled trial, was to compare the effectiveness of fat plug myringoplasty and chemical cauterization in the management of small centrally located perforations of the pars tensa.

Materials and Methods

The study was carried out over a period of 2 years on 62 patients selected from ENT OPD in our tertiary health care setup of central India. All the selected patients were grouped into two using a random allocation software EPi Info7.1.1.14. Group A included those who underwent fat plug myringoplasty while group B were those who underwent TCA cauterization.

Results

At 6 months follow up there was closure of perforation in 29 out of 30(96.6%) patients of group A and 29 out of 32(91%) patients of group B. In both groups success was defined by closure of perforation. Comparison of results was done using Fisher Exact Test. The difference between the success rates of the two procedures was statistically insignificant with p value of 0.6624, indicating that both the office procedures are equally effective and can be used according to the needs of the patients.

Conclusion

These office procedures can revolutionize the protocol of tympanoplasty which has an obvious higher morbidity and more days of absenteeism as compared to these minor procedures.

Keywords:

Myringoplasty; Trichloroacetic Acid; Fat Plug

In a developing country like India we encounter a lot of cases of COM. Causes of tympanic membrane perforation include infection, trauma, tympanostomy tube insertion as well as failed surgical repair. Although small sized perforations do not affect hearing too much, they expose the middle ear mucosa to the external environment leading to repeated troublesome middle ear infections affecting the quality of life of the patients. Hence management of tympanic membrane perforations is required which can be done by repairing the drum surgically.

Small central perforations can be managed by office procedures like fat myringoplasty and chemical cauterization of the rim of perforation.1 Day-care surgeries have now become an integral part of modern Otolaryngology. Different materials have been attempted for closure of perforation like Ivory tube, rubber disc, paper disc etc. Ringenberg[2] in 1962 first used fat as a graft material for tympanoplasty. In the past people

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Fig. 1. Harvesting of fat graft from the lobule

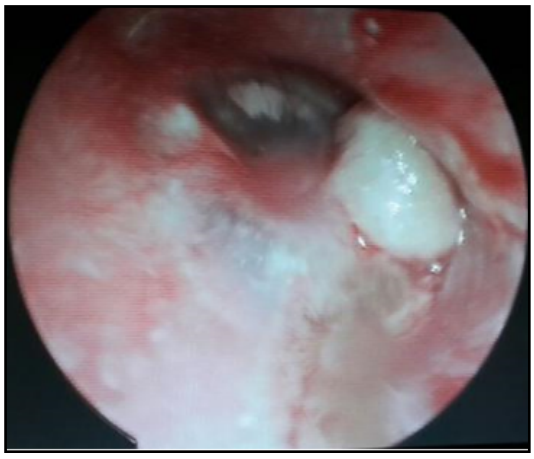

Fig. 2. Inserting fat plug like a dumbbell across the perforation

used silver nitrate for cauterization of margins of a perforation to promote healing. Okeneff in 1895 started the use of trichloroacetic acid for cauterization which has now become the agent of choice for removal of old epithelial margins.

Tympanoplasty is one of the most common operations performed in otology and temporalis fascia is the most common material used for the closure of tympanic membrane perforation. Conventional tympanoplasty is time consuming, has greater morbidity, is costlier and requires more days of absenteeism as compared to these office procedures. In this study our basic aim was to evaluate the success rates of TCA cauterization and fat plug myringoplasty in the management of small central perforation.

Materials and Methods

The study was carried out for 2 years from January 2014 to December 2015. The study group included patients in the age group of 16-50 years and having small central perforation in pars tensa which was either following otitis media, trauma or was a post tympanoplasty residual perforation. Those patients who had dry perforations of the size less than 25-30% of pars tensa in any quadrant, for at least 6 months duration, having mild hearing loss and who agreed for follow up for 6 months postoperatively were included in the study.

Detailed history and clinical examination with otomicroscopy was carried out to assess the perforation and to rule out any significant pathology of the tympanic cavity. Preoperative hearing assessment was carried out using tuning forks and confirmed by pure tone audiometry. Nasal and nasopharyngeal pathologies were ruled out in all patients. All the patients who fulfilled the inclusion criteria were divided into 2 groups using random allocation software EPi Info7.1.1.14. Group A included patients who underwent fat myringoplasty and Group B were those who underwent TCA cauterization. After proper written and informed consent fat plug myringoplasty was performed under local anaesthesia with 2% lignocaine and adrenaline (1 in 2,00,000) injected around the ear lobule and at four quadrants of the external auditory canal. A 1cm vertical incision was made on the posterolateral aspect of the ear lobule. A single fat piece approximately twice the size of the perforation was harvested. (Fig.1)

The wound was then closed with 3-0 silk. The edges of the perforation were de-epithelialized under the operating microscope using sickle knife. The harvested fat plug was then wedged snugly like a dumb bell, one part of which was in the middle ear and other lateral to tympanic membrane, supported by few pieces of antibiotic soaked gel foam on the lateral surface. (Fig. 2)

The patient was started on a course of antibiotic and antihistaminic and topical nasal decongestant for 7 days and then discharged after 2-3 hours on the same day with an instruction to keep the ear dry for 4 weeks.The patient was instructed to avoid straining or nose blowing

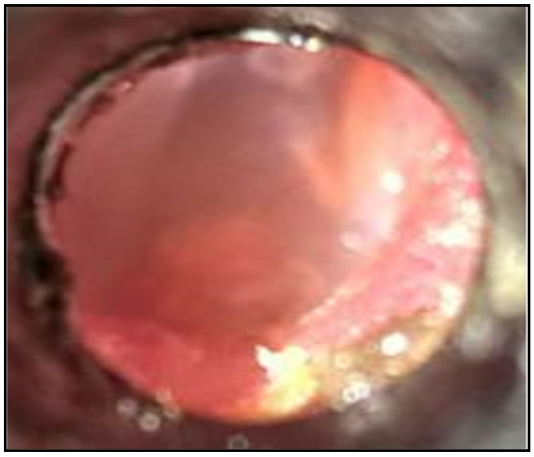

Fig. 3. Hue of fat seen through the healed tympanic membrane

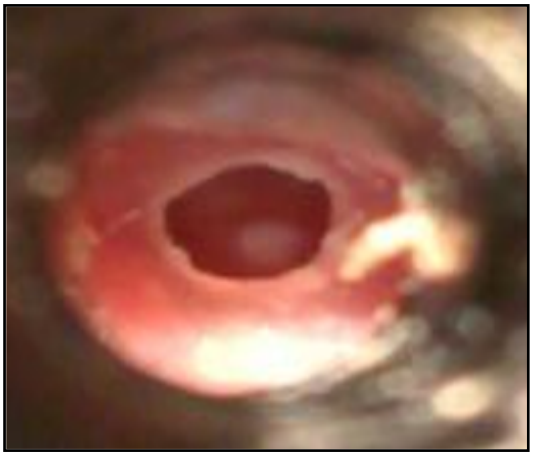

Fig. 4. Cauterized rim of the perforation using Trichloroacetic acid (50%)

for at least 4 weeks. No pack was kept and the patient was asked to instill local antibiotic drops for 2 weeks in the ear. Patients were followed up regularly for 6 months, biweekly for 1st month, thereafter at 2-month, 3 months and then 6 months (Fig. 3).

Chemical cauterization was carried out with 50% Trichloroacetic acid. (Fig. 4) The external auditory canal and tympanic membrane were anaesthetized by placing cotton ball soaked with 4% lignocaine for 5mins. Under the operating microscope the edges of perforation were cauterized by cotton wool applicator dipped in trichloroacetic acid solution by stroking in outward direction till a white rim of 0.5 mm width of cauterized margin was seen.

The patient was then sent home with an instruction to prevent entry of water in the ear and to instill 2-3 drops of ofloxacin ear drop thrice a day. A course of antihistaminic for one week was also given. The patient was then followed up weekly for subsequent sittings. A maximum of 5 sittings were carried out and signs of healing were seen. If a red rim, which is a positive sign of healing, was seen then the procedure was repeated every week till complete healing. If no signs of healing were seen for consecutive 5 sittings then the procedure was abandoned and was subjected to conventional tympanoplasty later. Patients in whom the closure of perforation was achieved were followed up regularly till 6 months.

Results

Among the 62 cases the average age was 29.2 years. In group A there were 17 males and 13 females while in group B there were 10 males and 22 females. The perforations were anterior in 18 patients, posterior in 20 and at the junction of anterior and posterior quadrants in 24 patients (Table I).

In our study 25 cases had minimal conductive hearing loss (15-25 dB) while 37 cases had mild conductive hearing loss (26- 40 dB). Closure of perforation in patients undergoing fat plug myringoplasty (Group A) was seen in 29 patients while fat got displaced in 1 patient and there was a residual perforation. Closure of perforation in patients undergoing TCA cauterization (Group B) was achieved in 29 patients while 3 patients did not show any signs of improvement even at the end of 5 sittings and hence the procedure was abandoned in them (Table II).

Discussion

Gone are the days of excessive manipulation of middle ear for small perforations with hardly any hearing loss, inflicting a lot of morbidity to these patients leading to at least 2-3 weeks of absenteeism from work and lot of medications.[1,3] Minimal interventions in the form of lobular fat graft myringoplasty and trichloroacetic acid cauterization have decreased the agony of patients

Table I: Site of Perforation

SITE OF PERFORATION OVER THE TM	GROUP A	GROUP B
Anterior	8	10
Posterior	14	6
At the junction	8	16

Table II: Comparison of TM perforation closure in Group A and Group B at the end of 6 months follow up

PERFORATION CLOSURE	GROUP A (N=30)	GROUP B (N=32)
Successful	29 (96.67%)	29 (90.62%)
Failure	1 (2.78%)	3 (9.37%)
Total	30	32

Comparison of results by Fisher Exact test was statistically insignificant with p value of 0.6624

with small perforations, as they are day care procedures requiring minimal hospital stay and are cost effective too. Morbidity is also lesser and the results are comparable to that of conventional tympanoplasty.

Hageman and Hausler[4] in their study carried out on 44 cases noted closure of perforation after fat plug myringoplasty in 91% of cases. Chalishagar[5] described in his series of 20 fat plug myringoplasties that closure of perforation was achieved in 90% cases at 6 months follow-up. In our study we had 96.67% success rate at 6 months follow-up with fat plug myringoplasty carried out on 30 patients.

Deddens et al. considered the size of perforation, a crucial factor. Perforations of the size of 5-30% of the drum surface were considered to have a good prognosis after fat graft myringoplasty, whereas larger perforations were less successful with fat graft alone.[6] We restricted our study to those patients who had less than or equal to 25-30% size of perforation (5 x 5mm). It is established that perforations larger than one quadrant of the tympanic membrane are unfavorable for the insertion of fat plug.

There are two theories of histological outcome of fat grafts: Neuhoff's replacement theory[7] and Peer's cell survival theory.[8] Transplanted fat according to Nuhof atrophies and is replaced either by fibrous tissue or by newly formed fat which is formed by large wandering histocyte like cell. According to Peer, the fat grafts appeared like normal fat tissue 1 year or more after transplantation. According to him all the original adipose cells do not die. Those fat cells which receive adequate blood supply survive whereas remaining degenerate; this explains the loss of volume. The transplanted fat gets covered by a connective tissue capsule which becomes progressively thinner and provides the basic platform for the grafting of the tympanic membrane.

Fat can be harvested from abdomen, buttock and ear lobule, although the fat obtained from lobule of pinna is easier to harvest, quicker and there is hardly any post operative scar. The fat of the ear lobule is denser and has the ability to be a nidus for epithelial and mucosal tympanic growth. It is characterized by revascularization activity as seen on otoscopy a few days after the procedure. There is a bulge on the tympanic membrane till the fourth month and later the fat graft disappears and a smooth sclerotic area remains by the end of 6th month. These findings of our study were well in compliance with those of Ozgursoy et al.[9]

The first recorded use of silver nitrate to stimulate closure of tympanic membrane perforations was by William Wilde in 1884[10] The office chemical myringoplasty was introduced by Roosa in 1876 and popularized by Derlacki in 1950 who reported good result and this procedure then came to be known as Derlacki method.[11] He along with his colleagues reported 75% success rates of healing in a study carried out in 131 perforations with an average of 14 treatment sittings requirement. In our series success rate was 90.6% in treatment of 32 small central perforations with

an average 6.4 sittings of TCA application. The principle of perforation closure by repeated acid cautery of the rim usually results into normal tympanic membrane with all the five layers.[12] The principle of chemical cauterization is that it breaks up fibrosis, promotes granulation and new tissue formation at the margins of perforation. According to Goldman, chemical myringoplasty is just not of historical interest but is an effective means of tympanic membrane closure.[13]

Conclusion

Fat plug myringoplasty and TCA cauterization are both very safe, simple and cost-effective procedures. Both are day care procedures, requiring very short time and have high success rates. Fat myringoplasty can be performed under local anesthesia while TCA cauterization requires topical or no anesthesia. Regenerated tympanic membrane contains all the five layers after both the procedures, while a normally healed tympanic membrane lacks the fibrous layer. The morbidity associated and the days of absenteeism are more with tympanoplasty. In our study the result shows that both the procedures are at par and can serve as suitable alternatives to conventional tympanoplasty for managing small central perforations.

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Assessment of the Utilization Pattern and Related Knowledge about Topical Nasal Decongestants among the Users

Valli Rajasekaran,[1] Puja Ghosh[1]

ABSTRACT

Introduction

Nasal decongestants are one of the drugs commonly prescribed by otorhinolaryngologists in their day to day practice. The excessive or inappropriate use of nasal decongestant due to rapid symptomatic relief leads to drug misuse or abuse. Inadequate knowledge about the drug usage leads to inappropriate drug usage.

Materials and Methods

A cross sectional study was done among 90 patients who were using topical nasal decongestants. A pre tested, pre validated questionnaire was used to assess the patient's knowledge, the utilization pattern and the attitude towards the drug usage.

Results

The mean age of presentation in our study was 38.4 years. Only 14.4% of the people knew the appropriate duration of drug usage. Only 33.3% knew about the probable side effects of prolonged drug usage. There was a significant correlation between knowledge and utilisation pattern of topical nasal decongestants usage and the literacy level. Though most of the people (46.7%) started using the drug after being prescribed by a doctor, only 14.3% among them strictly adhered to doctor's instructions.82% of the users were not worried about the prolonged usage as 73.3% believed that prolonged use may or will surely improve their symptoms. Though 66.7% users wanted to stop prolonged usage of the drug, 76.9% had varying difficulties in stopping the drug.

Conclusion

The knowledge and the utilization pattern regarding the drug usage were very low. The same was found to be better with increase in literacy level. Health professionals should play a major role in establishing a rational drug usage.

Keywords

Nasal Decongestants; Self Medication; Health Literacy; Cross-Sectional Studies; Surveys and Questionnaires

Topical nasal decongestants can be sympathomimetic amines or imidazole derivatives which cause vasoconstriction thereby reducing congestion and edema of nasal mucosa. These are commonly used to treat nasal obstruction in rhinosinusitis, allergic rhinosinusitis, nasal polyposis and following nasal surgeries[1] and are one of the most commonly prescribed drugs in ENT practice.

Topical nasal decongestants act much faster when compared to oral nasal decongestants which take about 15-30 minutes. This becomes the reason why people tend to abuse this drug. The prevalence of intranasal decongestant overuse was 49%.[2] Topical nasal decongestants are available over the counter without clinician's prescription in some countries like India[2] and hence are perceived as harmless drug by the users. Self-medication is very common even among educated population.[3,4] The practise of self medication is around 11.9% in urban Puducherry, South India.[5]

Among the numerous local and systemic complications associated with prolonged use of topical nasal decongestants, Rhinitis medicamentosa (RM) is a drug induced non allergic rhinitis.[6] The incidence of RM has been documented in various studies between 1-9%.[7,8] There is a lot of difference in opinion among various authors about the duration of use of topical nasal

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decongestant ranging from about 3 days to 2 months. However, the risk of Rhinitis Medicamentosa is more when topical nasal decongestants are used for more than 10 days.[9]

Depending on the knowledge and attitude about the dosage and side effects of topical nasal decongestants, the utilization pattern of the same varies among its users.[2] Very few studies are available regarding the knowledge and usage of topical nasal decongestants among its users. This study will help us in identifying the knowledge about the appropriate usage and the utilization pattern of topical nasal decongestants.

Materials and Methods

A cross sectional study was done in the ENT department for a period of 6 months from June 2017 to November 2017. The institutional ethical committee clearance was obtained. 90 patients above 18 years of age who visited our outpatient department (OPD) and were using topical nasal decongestants were included in our study. People using steroid sprays were excluded. Patients who were willing to participate in the study were enrolled in the study after obtaining an informed written consent. Patients were interviewed using pre tested and pre validated questionnaire (in the regional language Tamil) which contained details about sociodemographic factors, knowledge, attitude and practice about the use of topical nasal decongestants and their side effects. The data was collected and statistical analysis was done using SPSS software version 23. The data on knowledge, attitude and the practice regarding the use of topical nasal decongestants were analysed using descriptive statistics. The correlation between the knowledge and the utilization pattern with the literacy level were derived using chi square test.

Results

The study was done among 90 patients who were using topical nasal decongestants. The age of the patients in the study was ranging from 22-62 years. The mean age of presentation is 38.4. Most of the patients were males (60%) and the remaining were females (40%).

Most of the people who were using topical nasal decongestants had finished intermediate or post high school diploma (30%). Two of the patients who were abusing the drugs were medicos (professional) and only few (6.7%) were illiterates (according to Revised Kuppuswamy's classification).[10]

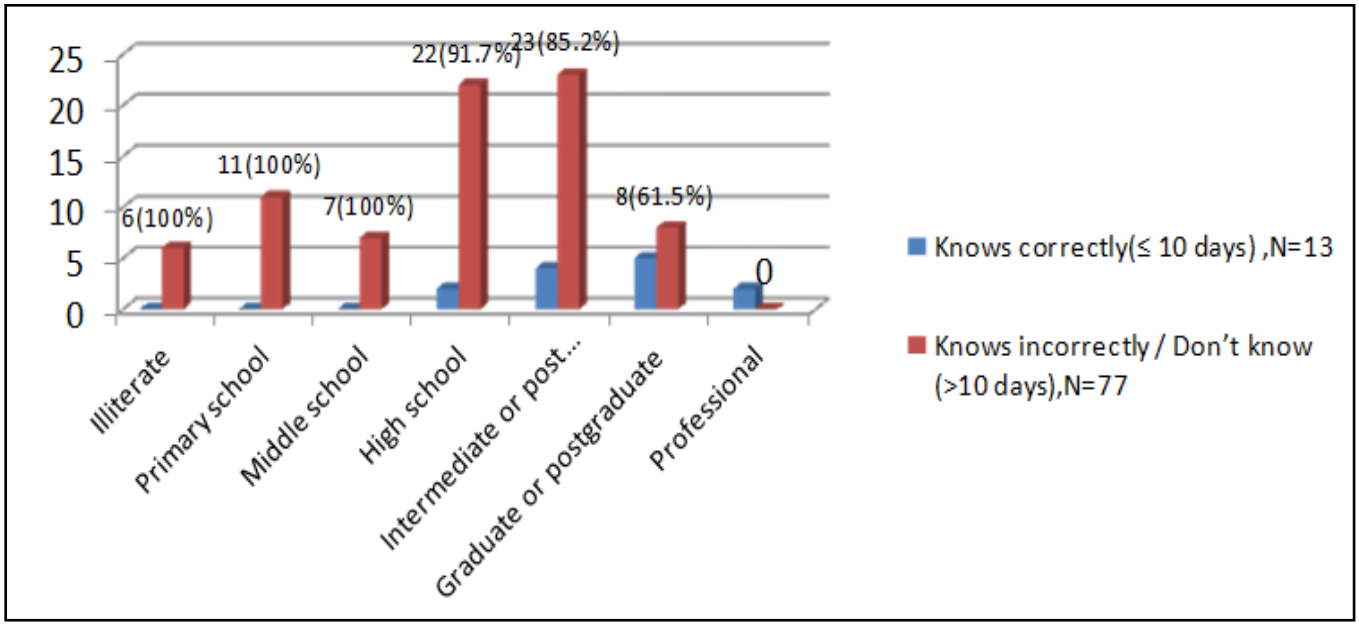

Fig. 1. Relation between knowledge about the appropriate duration of use of topical nasal decongestant and their education status

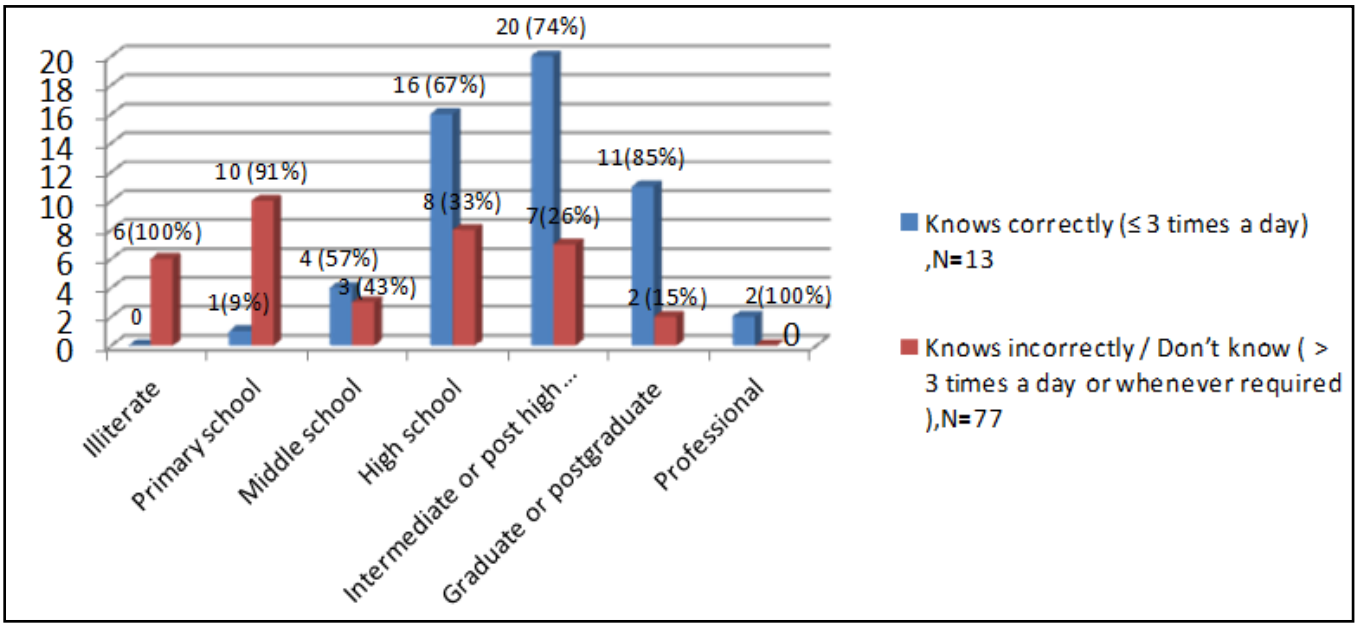

Fig. 2. Relation between knowledge about the appropriate frequency of use of topical nasal decongestant and their education status

The most common complaint for which the drug was prescribed was for nasal obstruction (83.3%). The second most common reason was following nasal surgeries (septal surgeries / FESS / turbinoplasty) which were about 30%.

Most of the patients (60%) were not aware of the exact duration of the drug usage. Among the people who knew about the duration of usage, only a few (14.4%) were aware of the exact dosage. The exact duration of drug usage was taken as less than 10 days. People who were using the drug for less than 10 days were considered as "knows correctly" and was compared with the literacy level. All the professionals were aware of the duration of the drug usage (Fig. 1).There was statistically significant association between the level of literacy and the knowledge about duration of drug usage ($p = 0.001$)

Most of them (60%) were aware of the frequency of usage. People who know that the drops can be used for ≤ 3 times a day were considered as "knows correctly". Their knowledge about the frequency of drug usage was compared with the literacy level (Fig. 2). There was statistically significant association between the level of literacy and the knowledge about the frequency of drug usage ($p = 0.000$).

The knowledge about the side effects of topical nasal decongestants was very poor. Only 33.3 % of the users were aware about the side effects. The most common side effects that the people were aware being nasal obstruction and burning sensation of nose, followed by hyposmia, epistaxsis and headache.

Most people started using the drug after being prescribed by the treating doctor (46.7%). (Fig. 3).Among the people who were prescribed by the doctor, 71.4% were instructed about the appropriate dosage and only 42.8% were clearly explained about the side effects of decongestant use. Chemists and advertisements in media had a significant role in initiating the use of topical nasal decongestants. Only 33.3% of the people who started using after being dispensed by chemist were informed about the dosage and none of them were explained about the side effects. Other sources of information were from peers, friends and family members.

Only 13.3% of the people were using the drops for less than 10 days. 40% of the patients were using the drops for more than 3 months. The duration of use was ranging maximum up to 3 years. Among the people who were using the drug for more than 10 days, 50% of them were using the drug only if they were symptomatic (more than 4 times a day). With increase in literacy level

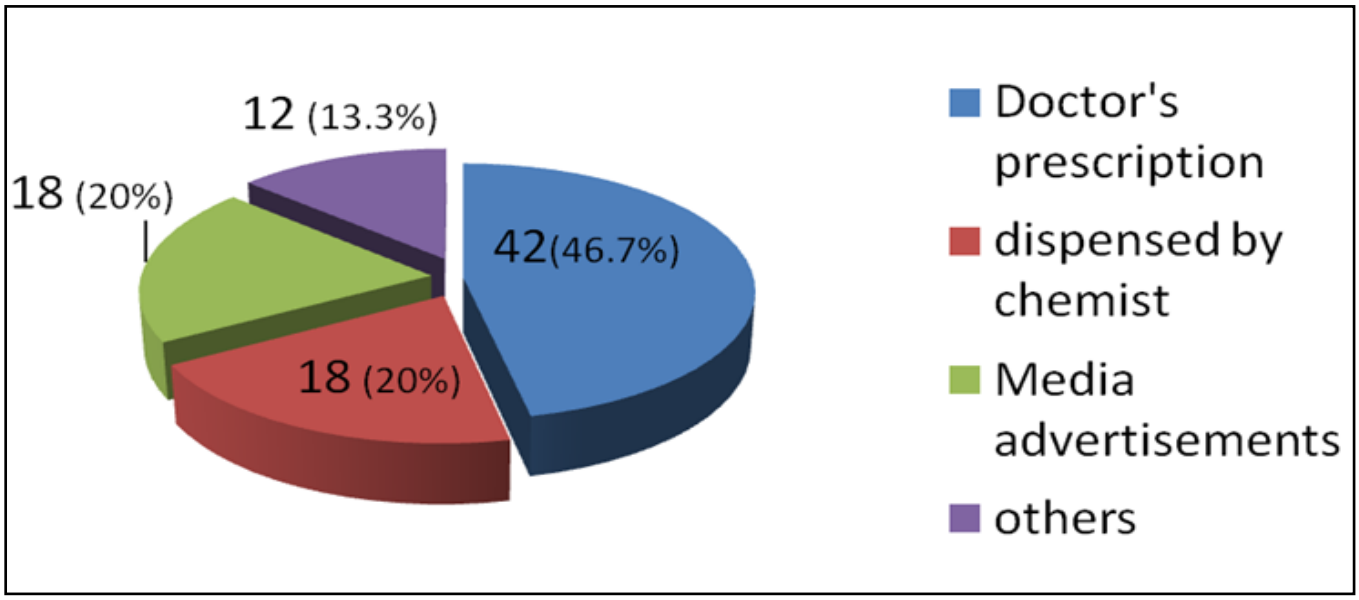

Fig. 3. How did you start using the drug?

the utilisation pattern was found to be better (Fig. 4). There was statistically significant association between the level of literacy and the proper utilisation pattern of the drug (p =0.033).

Only 14.3% of the patients were following the doctor's instructions all the time. Most of them (42.8%) were very rarely following the instructions (Fig. 5).

The attitude of the people regarding the use of topical nasal decongestants is analysed as shown below. (Table I)

Discussion

This study was conducted in our medical college among

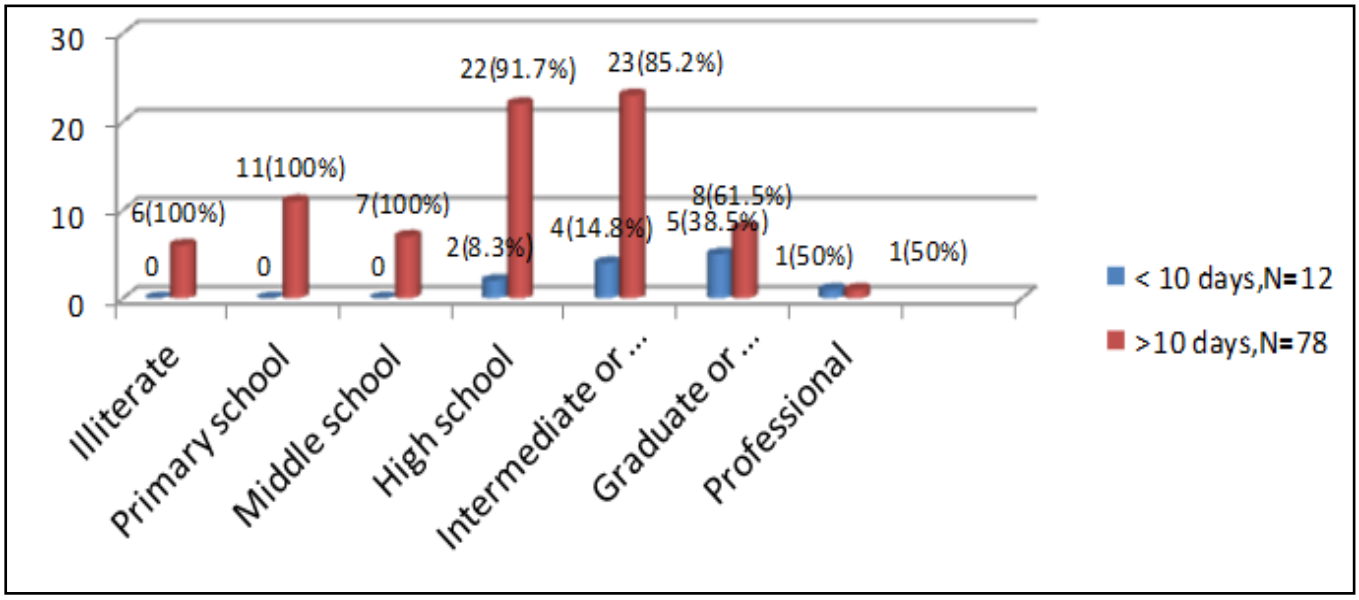

Fig. 4. Relation between utilization pattern of topical nasal decongestant and their educational status

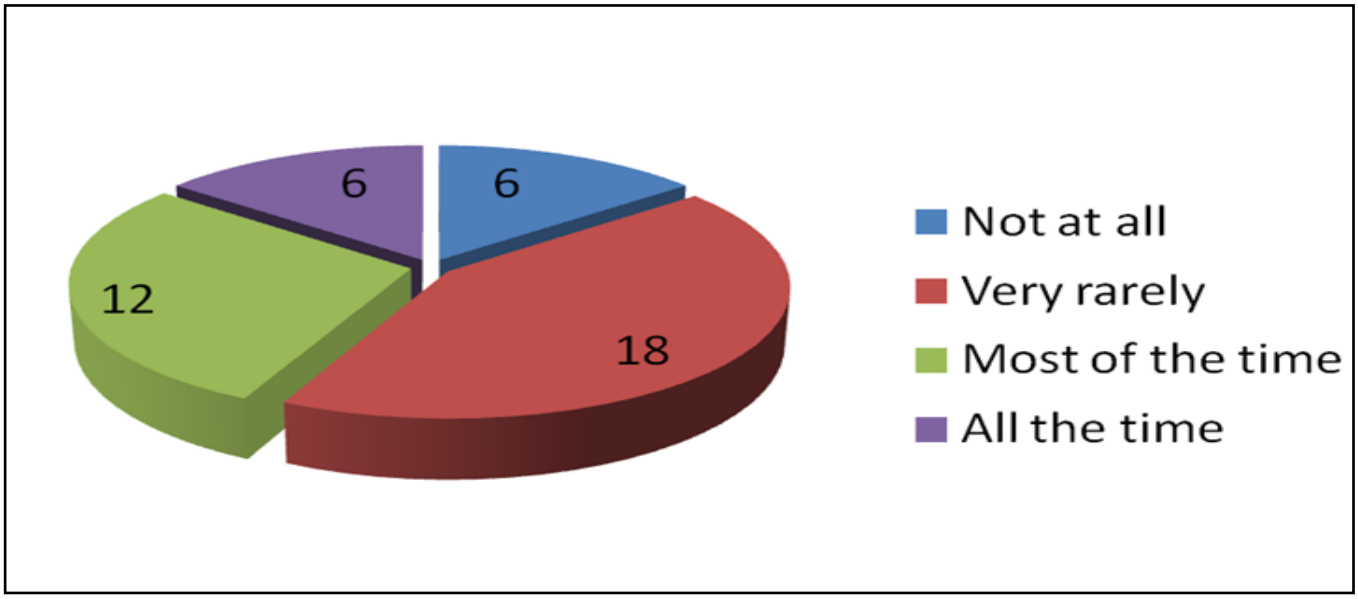

Fig.5. Distribution of study population based on their adherence to treating doctor's instruction

90 patients using topical nasal decongestants. The mean age of presentation was 38.4 years. Most of them were males.

The findings in our study shows that only 14.4% people were aware of the appropriate duration of use of topical nasal decongestants (<10 days). Similar findings have been documented in a study by Gill et al., where only 30% of the participants knew the recommended duration of use of topical nasal decongestants.[11] We observed that the literacy level has significant impact on the knowledge about the duration and frequency of usage of topical nasal decongestants. Higher the educational qualification better was their knowledge about the drug. It would be safe, if the people, who are using any drug, have sufficient knowledge about the drug's dose, time of intake, side-effect on over dose.[12]

Only 33.3% of the people were aware about the side effects of prolonged use of topical nasal decongestants. The finding in our study is supported by a similar study, where 32.9% were aware about the side effects.[13]

In our study, for most of the people the drug was prescribed by a doctor (46.7%). Among them 71.4% were offered guidance regarding the drug usage, 42.8%were explained about the side effects. In their study Gill et al.[11], Lenz et al.[13] and Zareen et al.[14] showed a similar number of people being prescribed and explained about the dosage and side effects by the physician. The findings in these studies are similar to the findings in our study. Health professionals have a potential role in preventing risks of self-medication. It is the duty of the consultant to explain about the prescribed drug, to provide therapeutic advice and to educate the patient.[12]

In our study, the source of information from advertisements in media was 20%. This could probably explain the role of media in influencing the drug usage in our country. Likewise advertisements have played a major role in initiating self medications of different drugs in various parts of India[15,16] and other countries around the world (Pakistan[17], Poland[18]). About 53.3% of the study population started using the drug without doctor's advice. Similar results were found in a study done in Brazil by Lenz et al, where 53% population were using topical nasal decongestant without a doctor's prescription.[13] In a study done in Jordan, systemic nasal decongestants are the highest purchased drugs (61.8%) without a doctor's prescription[17] but there is not much similar data available regarding topical nasal decongestants. In a study done by Selvaraj et al. amongst a population residing in urban Puducherry, 66.6% believed the concept of self-medication is harmless.[5] Similar results been obtained in a study done

Table I: Distribution of study population based on attitude towards usage of topical nasal decongestants

QUESTION	OPTIONS			
1. Do you think prolonged of topical nasal decongestants will improve your present condition? (N=90)	Will surely improve	May improve	Not sure	Will worsen
	19 (21.1%)	47(52.2%)	22(24.5%)	02 (2.2%)
2.Did you worry about our prolonged use of topical nasal decongestants ?(N=78)	Not at all	A little	Quite a lot	A great deal
	22(28.2%)	42(53.8%)	0	14(18%)
3.Did you wish you could stop using the nasal drops? (N=78)	Never	Sometimes	Often	Always
	26(33.3%)	36(46.2%)	10(12.8%)	6(7.7%)
4. How difficult would you find to stop using the topical nasal decongestants? (N=78)	Not difficult	Quite difficult	Very difficult	Impossible
	18 (23.1%)	49 (62.8%)	11(14.1%)	0

by Ahmad et al. amongst rural and urban north Indian population shows almost 60% of respondents believed that consuming non-prescriptions is safe.[20]

Our study showed that only 13.3% of people were using the drops for less than 10 days. However in a study by Lenz et al. showed 64.7% of the users were using the drops for less than 15 days.[13] This could be because this study was done among the students of health sciences. In our study 20% of the people have used the drug for more than a year. Similar results have been documented in the study by Lenz et al. (12.7%).[13] In a study done by Mehuys et al. 49% of the people were using the drug for at least a year.[2] This could be because, the study was done among people visiting pharmacy for self medication whereas in our study people who visited hospital OPD alone were included.

The education level of the patient had a positive effect on the utilization pattern of the drug in our study. Similar findings have been documented in study by Gill et al. among students of health sciences, where the utilization pattern was good.[11]

Only 2.2% of patients knew that continued use of decongestant will worsen the symptoms. Most of them (73.3%) believed that there will /may be some improvement. This could be because of poor knowledge on appropriate dosage and side effects among the drug users

Most of the patients (72%) were worried about prolonged use, but still they had continued the drug usage. This could be because of rapid symptom relief provided by the drug. Our result is supported by another study done by Ahmad et al., which shows 75% of the patients were worried that prolonged usage of a drug may cause side effects and dependency.[20] In our study, one third of the patients had never thought of discontinuing the drug usage. This clearly highlights the ignorance about the adverse effects and dependence on the drug. All the patients felt varying degree of difficulty in discontinuing the drug usage.

The results of our study shows that we need to go a long way as far as creating awareness about usage of topical nasal decongestants. As these drugs are commonly

prescribed by physicians, paediatricians, general practitioners in addition to otorhinolaryngologist, these treating doctors should be motivated to educate the patient. In fact in rural and suburban regions even the chemists have to be trained to educate and convince the patients not to abuse or misuse the drug. Media should also emphasis on the usage of the drug only with consultation by a doctor.

Conclusion

The knowledge about appropriate duration, frequency of use and side effects of topical nasal decongestant was very low. The knowledge and utilisation pattern of topical nasal decongestants was better with increase in literacy level .Most people have self medicated the drug without consulting a doctor. The ease of availability of the drug has to be regulated. Most of the people were not worried about prolonged use as they believed that continued use will improve their symptoms. People had varying degrees of difficulties in stopping the drug use. Improved knowledge and understanding about the topical nasal decongestants may result in rationale use. Health professionals play a vital role in educating the patient.

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All Cartilage No Stitch Type 1 Tympanoplasty – A Prospective Study

Debdulal Chakraborty,[1] Chiranjib Das, [1] Pritam Chatterjee, [1] Rajesh Hansda [1]

ABSTRACT

Introduction:

Although temporalis fascia is the commonly used graft material for tympanoplasty, cartilage has become the material of choice in cases with eustachian tube dysfunction, bilateral disease, total or anterior perforation of tympanic membrane, tympanosclerosis etc. Cartilage slices < 0.5 mm thick are similar to the tympanic membrane in their acoustic properties. The present study is aimed to describe stitch-less type 1 tympanoplasty with sliced tragal cartilage-perichondrium and evaluate anatomical, audiological and cosmetic outcomes.

Materials and Methods

A prospective study was conducted from March 2014 to August 2016, in ENT department of a Government Medical College and Hospital, West Bengal, India. Primary tympanoplasty cases irrespective of age, size and site of perforation, laterality and eustachian tube function were included in the study. History of previous tympanoplasty or mastoid surgery and cases requiring ossicular reconstruction or mastoidectomy were excluded from the study. Sliced tragal cartilage-perichondrium graft of 0.2 mm thickness was placed in underlay fashion through trans-canal or end-aural route.

Results

Among 95 cases 38 were male, 57 were female with age range between 7 to 68 years. Average operative time was 30 minutes. Graft take was successful in 97.89% of cases. Average air bone gap 12 months after operation was 13.03dB.

Conclusion

Sliced cartilage-perichondrium graft gives good balance between sufficient stability and adequate acoustic sensitivity. Moreover, no stitch technique reduces operative time and increases cosmesis.

Keywords:

Tympanoplasty; Stitch-less; Cartilage

The aim of tympanoplasty is to close tympanic membrane (TM) perforations, restore hearing, and reconstruct a healthy middle ear cavity.[1,2] Since the introduction of tympanoplasty by Wullstein in 1952 and Zoellner in 1955, different types of graft materials have been used to reconstruct the tympanic membrane.[3,4] These include temporalis fascia, perichondrium, cartilage, periosteum, vein, and fat etc. Presently, temporalis fascia is the most frequently used graft material. Although it is a highly successful procedure in 70-90% of normally ventilated middle ears, the prognosis is poorer in cases with eustachian tube dysfunction and defect of the entire tympanic membrane.[1,2] The rigidity, stiffness and bradytrophic metabolism of cartilage play an important role in resistance against retraction and graft failure.[5] So during the last decade, there has been a renewal of interest in the use of cartilage with surgeons reporting improved outcomes when compared with temporalis fascia.[6] Although, there have been concerns that cartilage may affect adversely acoustic transfer and hearing, studies have shown that cartilage slices < 0.5 mm thick are similar to the tympanic membrane in their acoustic properties.[7] The present study is aimed to describe stitch-less type 1 tympanoplasty with sliced tragal cartilage-perichondrium graft and evaluate the anatomical, audiological and cosmetic outcomes.

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Materials and Methods

The present prospective study was conducted in the ENT department of a Government Medical College and

Fig. 1. Harvesting tragal cartilage with perichondrium

Fig. 2. Final shape of cartilage-perichondrium graft

Fig. 3. After graft placement

Hospital, West Bengal, India, over the period of 2½ years from March 2014 to August 2016. Primary type 1 tympanoplasty cases irrespective of age, size and site of perforation, laterality and eustachian tube function were included in the study. In all cases the ear was dry and with normal middle ear mucosa for at least one month prior to surgery. History of previous tympanoplasty or mastoid surgery, discharging ear, cases requiring ossicular reconstruction or mastoidectomy were excluded from the present study. Those without sufficient follow-up for one year after surgery, without preoperative or postoperative hearing tests were also excluded.

A thorough history of the patients was taken including age, sex, socioeconomic background, side and duration of disease, history of previous ear surgery etc. Clinical evaluation of the ear included site and size of perforation, presence of adhesive changes, tympanosclerosis or retraction, and condition of middle ear mucosa. Regional and systemic examinations were also done. Pure tone audiometry and tympanometry were done in all patients.

After proper preoperative evaluation, patients were operated under local or general anaesthesia as required. End-aural or trans-canal route was selected according to the shape and size of external auditory canal and perforation. End-aural incision was limited within external auditory canal in all cases. Local infiltration was done with 2% lignocaine plus 1:2,00,000 adrenaline. Margin of the perforation was made raw. Tympanomeatal flap was raised and handle of malleus was denuded. Ossicular integrity and mobility was checked. After giving incision on medial part of tragus, cartilage was harvested. A lateral cartilaginous bridge of about 2 mm was left for aesthetic reason (Fig. 1). Cartilage graft was shaped and sliced to 0.2 mm thickness with the help of cartilage slicer, keeping perichondrium on one surface. Cartilage is stripped approximately 0.2 mm circumferentially from the edge using circular knife. A v-shaped notch is made from center to periphery to accommodate malleus handle (Fig. 2). The graft was placed over the handle of malleus and medial to tympanic annulus with perichondrium facing laterally extending onto external auditory canal (Fig. 3). Absorbable gelatin sponge was placed over the graft. It was also used to pack the external auditory canal and secure incision line (Fig. 4). Patients were discharged next day with antibiotics. Each case was reviewed at 1 week, 3 week, 2 months, 6 months and 1 year (Fig. 5). Post-operative pure tone audiometry was done at 6 months and 1 year.

Results

In the study period we operated on 100 cases. But five cases were lost to follow up. Among 95 cases 38 were male, 57 were female with age range between 7 to 68 years (Table I). Most were in the 3rd decade of life. Average operative time was 30 minutes. Two months after operation, graft take was successful in 24 out of 24 cases (100%) in small perforation, 54 out of 56 cases (96.43%) in medium perforation, and 13 out of 15 cases (86.67%) in large perforation (Table II). Six months

Fig. 4. Incision line secured with gelatin sponge

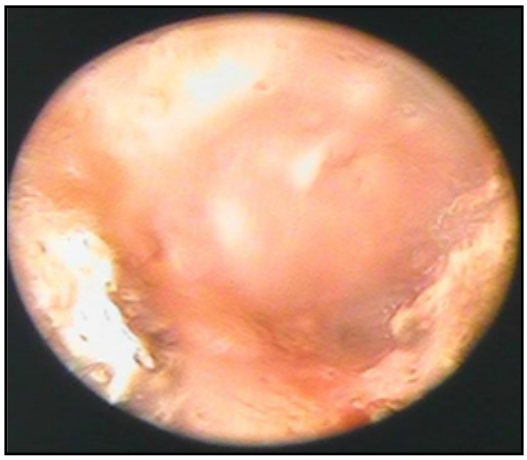

Fig. 5. 6 months post-operative photograph

after operation, one out of two cases in each group of medium and large perforation healed spontaneously. So the final successful graft take was 97.89%. Two cases of residual perforation were treated at the end of 12 months after operation, one with chemical cautery, another with fat grafting. Average Air Bone Gap (ABG) 6 months after operation was 14.78 dB, 18.54 dB and 22.69 dB in small, medium and large perforation group respectively (Table III). Average ABG 12 months after operation was 12.29 dB, 13.56 dB and 14.09 dB in small, medium and large perforation group respectively. Wound healing of the graft taking site was perfectly well in all patients.

Discussion

The main purpose of tympanoplasty is to repair tympanic membrane perforation, thus protecting middle ear from infections and improving the hearing.[1,2] Factors affecting the success rate of tympanoplasty are age, site and size of perforation, condition of middle ear mucosa, function of the eustachian tube, type of graft used, and surgical experience.[8,9,10] Temporalis fascia has been the most commonly used graft material for tympanoplasty, and the success rate is nearly 90%.[11,12] Causes of tympanoplasty failure using a temporalis fascia graft are poor eustachian tube function, bilateral disease, large and anterior perforation, tympanosclerosis, revision surgery, tobacco smoking and low socioeconomic condition.[13,14] A more rigid, and more resorption and retraction resistant graft material, may provide better success rates. Cartilage is formed mainly by type 2 collagen having higher tensile strength than type 1 collagen found in fascia, which contributes to its stability.[15] Cartilage contributes minimally to an inflammatory tissue reaction. A cartilage graft has a very low metabolic rate. It receives its nutrients by diffusion and perichondrial attachment on one side increases its

Table I: Age and Sex distribution of the patients

AGE IN YEARS	MALE	FEMALE	TOTAL
≤ 10	2	3	5
11-20	13	14	27
21-30	11	22	33
31-40	6	10	16
41-50	3	4	7
51-60	2	3	5
≥61	1	1	2
Total	38	57	95

Table II: Distribution of patients according to pre-operative and post-operative condition of TM

		CONDITION OF TM IN POST-OPERATIVE PERIOD			
		2 MONTHS		6 MONTHS	
		INTACT	PERFORATED	INTACT	PERFORATED
Condition of TM in pre-operative period	Small perforation	24	0	24	0
	Medium perforation	54	2	55	1
	Large perforation	13	2	14	1
Total		91 (95.79%)	4 (4.21%)	93 (97.89%)	2 (2.11%)

viability. Even if the cartilage becomes non-viable it remains functional mechanically. It is easy to work with because of its pliability, and resists deformation from pressure variations.[16] The main advantage of cartilage tympanoplasty is that epithelisation may continue over the cartilage surface even if the graft detaches anteriorly.[17] The other advantage is that cartilage tympanoplasty avoids synechia formation between the graft and promontory, because there is no need to use absorbable gelatin sponge in the middle ear to support the graft.[17] Therefore, cartilage has now become the preferred graft material over temporalis fascia in high risk perforations.

Cartilage graft was first described Heerman in 1962.[18] Mirko Tos described 23 methods of cartilage tympanoplasty to reconstruct the eardrum and proposed a classification into six main groups. We performed tympanoplasty with cartilage-perichondrium composite island grafts, which falls under group C of Tos classification (2008).[19] Khan et al. used shield-

Table III: Comparison of mean pre-operative, 6 months post-operative and 12 months post-operative ABG between patients with small, medium and large TM perforations

	PRE-OPERATIVE ABG (IN DECIBEL)	6 MONTHS POST-OPERATIVE ABG (IN DECIBEL)	12 MONTHS POST-OPERATIVE ABG (IN DECIBEL)
Small perforation	25.56	14.78	12.29
Medium perforation	31.76	18.54	13.56
Large perforation	38.53	22.69	14.09

Table IV: Comparisons of graft take success rate with previous authors

AUTHOR	TECHNIQUE	NO. OF PATIENTS	SUCCESS RATE
Amedee RG et al (1989)[24]	Palisade cartilage	52	100%
Dornhoffer JL (1997)[12]	Cartilage	22	100%
Kazikdas KC et al (2007)[1]	Palisade cartilage	23	95.70%
Kalcioglu MT et al (2009)[29]	Cartilage island	60	95%
Neumann A et al (2010)[5]	Palisade cartilage	29	100%
Chen XW et al (2010)[30]	Perichondrium/cartilage composite graft	74	92%
Khan MM et al (2011)[20]	Sliced tragal cartilage	223	98.20%
Yurttas V et al (2014)[17]	Cartilage island	87	93.10%
Present study (2016)	Sliced tragal cartilage perichondrium composite graft	95	95.79%

sliced tragal cartilage-perichondrium composite graft and their success rate was 98.20% (Table IV).[20] Neumann et al. reported a graft take rate of 100% in their palisade cartilage tympanoplasty study.[5] Sismanis et al. reported 93.5% success rate in their revision tympanoplasty cases.[21] In the present study, graft take rate was 97.89%. In 4 cases residual perforations were observed. These perforations were between the remnant tympanic membrane and cartilage part of the graft due to malposition of the cartilage. Tek et al. reported 3 graft failures in their cartilage tympanoplasty series, and they were anterior perforations.[22] The perceived disadvantage of the cartilage graft is that it creates an opaque tympanic membrane, which could potentially obscure post operative examination of any middle ear pathology.[23]

Although the graft-take rate is high in cartilage tympanoplasty, hearing gain might not be satisfactory due to its effect on tympanic membrane elasticity. According to Zahnert's experimental study, cartilage slices < 0.5 mm thick are similar to the tympanic membrane in terms of their acoustic properties.[7] Overbosch in 1971 was first to describe a microslice technique to improve the acoustic properties of the reconstructed tympanic membrane. He cut cartilages by a dermatome into plates with thickness of 0.2-1 mm.[24] Recent studies have shown that no statistically significant difference exists in temporalis fascia and cartilage tympanoplasties in terms of postoperative hearing results.[11,12,25] In 2004, Gierek et al. observed that there was no significant hearing difference between cartilage and temporalis fascia.[26] Couloinger et al. observed 59 cartilage graft tympanoplasties and 20 temporalis fascia graft tympanoplasties in 2005 and they reported no post-operative hearing difference between the two groups.[27] Gerber et al. compared the cartilage to temporalis fascia in a frequency-specific manner and again no significant difference was observed. They

found the average improvement in the air conduction threshold to be 10 dB.[11] In the present study, satisfactory hearing results were observed. Moreover, ABG closure continued to improve in patients with large perforation during the follow-up period. The connection between cartilage graft and tympanic membrane and malleus is important for acoustic transfer. Furthermore, large eardrum perforation may require longer time for healing and tissue remodeling between the cartilage graft and original tympanic membrane, and even the malleus.[28] So longer duration of follow up is necessary to comment regarding the improvement of hearing and graft viability.

Conclusion

Cartilage graft is experiencing a renaissance in tympanoplasty in high risk perforations. It gives otologists a reliable armamentarium in reconstruction of tympanic membrane. Cartilage of < 0.5 mm thickness maintains a perfect balance between sufficient stability and adequate acoustic sensitivity. Moreover, no stitch technique is minimally invasive, reduces operative time, hospital stay and yields cosmetically better results.

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Comparison of Microdissection Microlaryngeal Surgery with Carbon Dioxide Laser in Management of Benign and Premalignant Lesions of Larynx

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ABSTRACT

Introduction

Dysphonia is caused by voice misuse and various environmental factors. It is manifested as varied pathological lesions of the vocal cords. Surgical excision of these lesions is mainly by conventional cold steel or laser assisted microsurgical techniques. Both modalities have seen extensive advancements and refinement in technologies in the recent past. In this study we have compared the microdissection microlaryngeal treatment and microspot superpulsed beam carbon dioxide (CO2) laser assisted surgical techniques for the management of benign and precancerous lesions of the vocal cords.

Material and Methods

A total of 36 cases of benign lesions of vocal cord, were divided randomly to undergo surgery either by microdissection or CO2 laser assisted techniques. The groups were assessed through vocal cord morphological observation and subjective voice assessment parameters GRBAS score and VHI10 index.

Results

Peroperative bleeding was observed to be significantly reduced in the laser excision group. However, operating time was significantly increased in this group. Patients recovered remarkably well following both the techniques as denoted by voice parameters. No difference was observed in duration of hospital stay.

Conclusion

Both surgical techniques give satisfactory results in their management of benign and precancerous lesions of the vocal cords. Both techniques have their advantages and disadvantages. After a learning curve, laser surgery with its precision and cleaner surgical fields will be more effective in the management of such cases.

Keywords

Lasers; Microdissection; Vocal Cords

Dysphonia affects people of all ages, gender and social structure. It is caused by a variety of voice disorders. The reasons are multifactorial usually due to improper voice use and environmental factors. The condition is distressing to the individual and needs accurate diagnosis and timely institution of appropriate therapeutic intervention.1

Based on stroboscopic and scanning electron microscopy evidence, the vocal fold is divided into five layers. Only the mucosal epithelial and Reinke's space vibrate to produce a tone. The treatment of voice disorders hence requires minimally invasive dissection in these layers for an effective return to proper sound function and voice.

Two types of microsurgical techniques are widely practiced, the conventional cold steel laryngeal microsurgery and the laryngeal laser micro-surgery. The role of carbon dioxide (CO2) laser in early laryngeal carcinoma treatment is well documented.[2] However, treatment of benign laryngeal diseases such as vocal

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cord polyps, vocal nodules and precancerous lesions such as vocal cord leukoplakia, remain controversial.[3,4]

Advancements have been made in both techniques to redefine and improve outcomes of surgery of lesions of the vocal cords. Microsurgery of the vocal cords has become more precise with the advent of the microdissection and microflap techniques. Early use of CO2 lasers induced greater thermal damage which affected the healing and outcomes of the surgery. The introduction of the microspot mode has refined the mode of delivery and depth of delivery of the laser to the tissue.[5]

In the present study, the newer advancement in both techniques, have been compared in the management of benign and precancerous lesions of the vocal cord. The groups were assessed through vocal cord morphological observation by fibreoptic laryngoscopy and by comparative analysis of subjective voice assessment parameters using GRBAS and VHI index scores.

Materials and Methods

This study was conducted at the Department of Otolaryngology-Head and Neck Surgery, at a tertiary care center at Kolkata between 2014-2016 after ethical clearance.

Fifty cases of vocal cord lesions as confirmed by fibreoptic laryngoscopy were included in the study. Cases which on histopathology were diagnosed to be malignant and cases which could not be followed up for 3 months postoperatively were excluded from the study. After excluding such cases, a total of 36 cases were evaluated and studied on the following parameters:

a. Visual analysis on fibreoptic laryngoscopy
b. Voice analysis –VHI 10 and GRBAS indices
c. Time of surgery analysis
d. Peroperative bleeding

The results were analysed using Statistical Package for Social Sciences (SPSS) version 20. Fischer Exact test was used to find the significance of study parameters for the categorical data and the Student t test was used for the data variables in the continuous scale. The Student unpaired t test was use to compare the data between the two groups and the Student paired t test for comparison between the preoperative and postoperative results within the same group. In all the tests the level of significance was taken as $p \leq 0.05$.Written and informed consent was taken prior to surgery for each patient. Preoperative assessment was done with fibreoptic laryngoscopy and subjective analysis of voice.

Patients were then assigned to the following two groups by the total consecutive sampling method:

a. Microdissection group
b. Laser excision group

All the patients underwent surgery under general anaesthesia. Laser safe endotracheal tube were used for intubation in patients of the laser excision group.

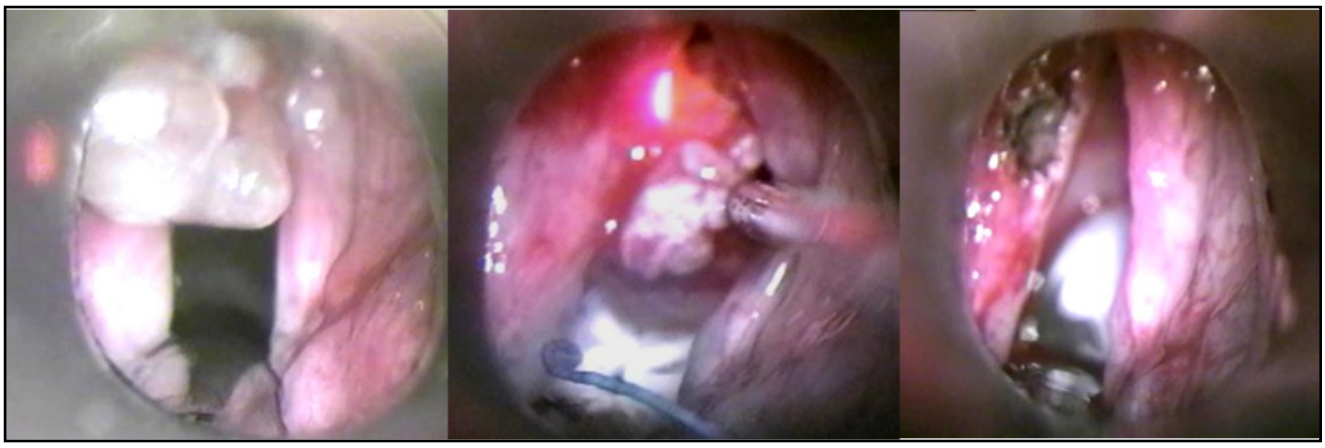

Fig.1. Preoperative, intraoperative and immediate postoperative view of laser assisted microlaryngeal surgery

Operating microscope at 400-mm focal length through a suspension laryngoscope was used for all surgeries.

In microdissection group, excision of small vocal nodules and pedunculated polyps was done by hydrodissection using normal saline followed by excision using microforceps and microscissors with preservation of the underlying middle and deep layers of the lamina propria and muscles.For larger nodules and diffuse polyps, the microflap technique was employed.

In laser excision group, institutional laser precautions and safety procedures were strictly followed. Laser microsurgery was performed using microspot CO2 surgical laser. Firstly, hydrodissection was done with normal saline and then, pledgets soaked in normal saline placed over the surrounding areas to prevent accidental injury to surrounding structures. The laser beam was focused to smallest spot size (0.2–0.25micrometre) for excision and set at 0.05 seconds repeat superpulse mode after holding the lesion with laryngeal forceps (Fig 1).

Postoperative assessment of patients by fibreoptic laryngoscopy after 1 week and after 3 months, were classified as "Excellent result"- voice returned to normal and vocal cords appeared normal, "Good result" – mild hoarseness present or lesion did not disappear completely and "Poor result"– no change in quality of voice. Assessment of all patients was also done by subjective methods of voice assessment (GRBAS score, VHI 10 index) after 3 months for comparative analysis.

Results

A total of 36 cases underwent surgery for benign lesions and precancerous of vocal cord out of which 14 (38.89%) were male and 22 (61.11%) were female. The patients were between the age range of 20 years to 60 years and mean age was 39.99± 9.18 yrs. The distribution of patients in the microdissection group according to the pathology was vocal cord polyp (44.4%), vocal cord nodules (38.9%), vocal cord cyst (5.5%) and keratosis of vocal cord (11.1%).

Similarly, patients included in laser excision group were vocal cord polyp (38.9%), vocal cord nodule (44.4%), vocal cord cyst (11.1%) and leukoplakia of vocal cord (5.6%). (Table I).

1. Voice outcomes

In our series, patients recovered remarkably well subjectively in both the groups.

Microdissection group

- Mean GRBAS score (15.92preop. to 7.54 postop.)

TABLE I: Preoperative assessment of cases

AGE DISTRIBUTION (YRS)	MICRODISSECTION	LASER EXCISION GROUP
21-30	**4**	**5**
31-40	**5**	**4**
41-50	**8**	**6**
>50	**1**	**3**
Mean age	**38.13 ± 10.59**	**41.64± 7.95yrs**
PATHOLOGICAL DISTRIBUTION	**MICRODISSECTION GROUP**	**LASER EXCISION GROUP**
Vocal cord polyp	**8**	**7**
Vocal cord nodules	**7**	**8**
Vocal cord cyst	**1**	**2**
Leukoplakia of vocal cord	**2**	**1**

- Mean VHI 10 score (8.17 preop. to 2.72 postop.)

Laser assisted surgery

- Mean GRBAS score (16.14 preop. to 7.28 postop.)
- Mean VHI 10 score (8.06 preop. to 2.89 postop.)

2. Time analysis

The total intubation time in the microdissection group was 70.35 minutes while in the laser assisted group it was 77.06 minutes. The total hospital stay in the microdissection group was 46.76 hours and in the laser assisted group was 47.65 hours. In our study, operating time was significantly increased in the laser assisted group (p value <0.05). No difference was, however, observed in duration of hospital stay.

3. Peroperative bleeding

In our study, peroperative bleeding was significantly reduced in the laser assisted group (p value of 0. 0015 was obtained).

The results are summarized in Table 2.

Discussion

Benign and precancerous, lesions of the vocal folds, encompass changes in epithelium (vocal nodules, leukoplakia, hyperkeratosis, acanthosis, dysplasia, etc.), exudative changes in the Reinke's space (vocal cord polyps, Reinke's edema), granulomas (contact granuloma, intubation granuloma), scarring, and subepithelial lesions such as cysts.[6-9]

They are caused as a response to vocal trauma to the laryngeal mucosa by means such as excessive talking or coughing, use of inappropriate pitch and throat clearing. Vibration-induced elevations in capillary pressure have been hypothesized to induce vocal edema and nodules.[10]

The modern optimal treatment of benign and precancerous vocal fold lesions has primarily been a choice between microsurgical and laser surgical techniques. The properties of lasers which makes it beneficial in surgery are its monochromaticity (only one wavelength), coherence (wave travels in phase and in one direction) and concentrated direction of the beam.[11] However, lasers cause thermal tissue damage which may cause excessive scarring. Factors which cause the damage is dependent upon, the tissue absorption coefficient, the wavelength of the laser, the duration of delivery, and the thermal relaxation time ie. time required for the tissue to lose 50% of the heat absorbed.[12]

Microsurgical techniques have become more refined and precise with more modern instruments and techniques such as micro dissection and mucosal flap techniques. In the past, lasers proved to be less effective than microsurgery at treating most benign lesions due to high thermal burns and laser surgery related complications such as fire in the endotracheal tube. However, with advancements in the CO2 laser technology such as the microspot technique and preventive protective precautions, surgery with lasers have become safer, precise and associated with minimal bleeding. Continuing recent advances in both surgical techniques ensure that the outcomes of surgery have become more effective.

In our case series of 36 cases, patients recovered remarkably well in both the groups. Voice assessment by the VHI and GRBAS in both groups showed improvement in post-operative results. There was no statistical difference in the results in voice assessment after surgery in both groups. With more experience in recent times in the use of laser, surgical and voice results have improved as compared to earlier studies.[12]

With the development of the microspot CO2 laser with a spot size of 250 μm or less, the potential risk to the deeper tissues has been minimized due to time available for tissue cooling between the laser pulses. Furthermore, superpulse modes have allowed for the ability to provide higher power while minimizing thermal damage.

Setting up the laser surgical unit as well as the procedure is time consuming. In our study, operating time was significantly increased in the laser assisted group as compared to the microdissection technique (p value of <0.05). The postoperative recovery and morbidity in both groups was not statistically significant. No difference was hence observed in duration of postoperative hospital stay. In the study conducted by Benninger et al, there were no differences in intubation (surgical) time, recovery room time, or total time of

TABLE II: Post operative results

1	FACTOR EVALUATED	MICRODISSECTION GROUP	LASER EXCISION GROUP	P VALUE (BETWEEN THE 2 GROUPS)
1a	Videolaryngoscopic appearance (after 1 week)			
	Excellent	13	16	
	Good	5	2	
	Poor	-	-	
1b	Videolaryngoscopic appearance (after 3months)			
	Excellent	16	15	
	Good	2	3	
	Poor	-	-	
2	VOICE OUTCOMES			
2a	VHI 10 indices			
	Preoperative VHI10 index	8.17 ± 0.69	8.06 ± 0.78	
	Postoperative VHI10 index	2.72 ± 0.628	2.89 ± 0.66	
	p value	p value of 0.0001 (between pre and post op observations)	p value of 0.0001 (between pre and post op observations)	0.0001
2b	GRBAS score			
	Mean GRBAS score	Preoperative -15.92	Preoperative -16.14	0.0001
		Postoperative -7.54	Postoperative -7.28	
		p value- 0.0001	p value- 0.0001	
3	TIME ANALYSIS (IN HOURS)	MEAN/SD	MEAN/SD	
3a	Duration of operation (total intubation time)	70.35/1.71	47.65/5.72	0.0072
3b	Duration of hospital stay	46.76/4.83	3.06/0.55	0.6173
4	PER OPERATIVE BLEEDING			
4a	Per operative Bleeding (in ml)	3.88/0.76	3.04/0.52	0.0015

stay.[5]

Peroperative bleeding was significantly higher in the microdissection group as compared to the laser assisted group (p value of 0. 0015) especially in the precancerous cases. The properties of lasers suitable and beneficial in obtaining haemostasis in surgery are its monochromaticity (single wavelength), coherence (travels in phase and in one direction) and concentrated direction of the beam. Our findings were similar to study by Mizuta et al, who showed that use of CO2 laser was particularly indicated for vascular lesions of the vocal cords as it helped to achieve better haemostasis.[13]

However, lasers can cause thermal tissue damage. The tissue absorption coefficient, wavelength, duration of delivery and the thermal relaxation time (time required for the tissue to lose 50% of the heat absorbed), all affect the degree of thermal penetration.[14] Laser burns have been reported due to fire within the endotracheal tube. The use of laser endotracheal tubes and saline soaked gauze around the tube prevented such incidents.[15,16] In our study we incorporated similar precautions and did not have any such complications.

The microspot CO2 laser with a spot size of 250 µm or less prevents collateral damage. The potential thermal risk to the deeper tissues is further minimized with the use of superpulse modes due to time available for tissue cooling between the laser pulses. Fewer complications, side-effects and better postoperative voice quality have been reported in the treatment of benign lesions of vocal cords with lasers due to their accuracy, need of minimal tissue manipulation and unobstructed vision of the operative site with minimal surrounding tissue damage.[12,17] However, we feel that the results are largely technique-dependent. The surgeons experience and skills has a major role to play in the results of laser surgery. In our study, after a learning curve, the ease of surgery and results obtained improved progressively.

Conclusion

Microsurgical dissection and lasers are the surgical modalities of treatment for benign and pre malignant lesions of the vocal cords. We found both techniques to give satisfactory results in their management. Though both techniques have their advantages and disadvantages, laser surgery, after a learning curve, will benefit for its precision and limited need for tissue handling in the management of such cases. An analysis of larger series and results of more centers are required to refine the procedures for management of benign and pre malignant lesion of larynx.

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A Study on Hospital Acquired Infections among Patients in a Tertiary Care Hospital of Darjeeling District, West Bengal

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ABSTRACT

Introduction:

Hospital Acquired Infections (HAI), also called 'Nosocomial Infections' are identified at least 48-72 hours following admission to health institution. In many hospitals, HAI appears to be a hidden, cross-cutting problem. Thus a continuous surveillance is imperative for determining the extent of the problem and its effective prevention and control. Present study determines the incidence and different types of hospital acquired infections and the bacterial pathogens responsible for those.

Materials and Methods

An observational longitudinal study was undertaken during January to June 2014, among 107 patients admitted in ENT wards of North Bengal Medical College and Hospital (NBMCH), selected by consecutive inclusion technique. Information was taken using a predesigned, pretested semi-structured schedule. The collected data were analyzed as frequencies, percentages and means ± standard deviations.

Results

The present study found incidence rate of hospital acquired infections as 19.6% and incidence density as 26.35 per 1000 patient days. Surgical site infection was commonest type (57.2%) followed by urinary tract infection (23.8%) and blood stream infection (19.0%) respectively. 15.4% of blood cultures, 100.0% of surgical wound swab cultures and 21.7% of urine cultures were positive and gram negative bacteria were most frequently occurring organisms. Most commonly found bacteria were Pseudomonas and Klebsiella.

Conclusion

Even if in a tertiary health care facility, hospital acquired infection rate could not be brought down into <10%. So implementation of stringent guidelines on prevention of HAI and continuous surveillance and monitoring system can help to diminish this problem in future.

Keywords:

Hospital Acquired Infections; Nosocomial Infections; Surgical Wound Infection; Urinary Tract Infections; Bacterial Infections

Patient care is provided in facilities which range from highly equipped clinics and technologically advanced tertiary care hospitals to front-line units with only basic facilities. Despite progress in public health and hospital care, infections continue to develop in hospitalized patients and may also affect hospital staff.

Hospital Acquired Infections (HAI), also called 'Nosocomial Infections', are defined as infections which are not present or not incubating when the patient is hospitalised and are acquired during the hospital stay. It is usually defined as an infection that is identified at least 48-72 hours following admission to health institution.[1] The term 'Health Care Associated Infection' (HCAI) is now widely used instead of the traditional nosocomial infections.[2]

Epidemiological and etiological characteristics of

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hospital acquired infections show variations among countries and even among different hospitals in the same country. Hospital acquired infections occur worldwide and affect both developed and resource-poor countries. Infections acquired in health care settings are among the major causes of death and increased morbidity among hospitalized patients. This adversely affects patients well-being.[3,4]

A prevalence survey conducted under the auspices of World Health Organisation (WHO) in 55 hospitals of 14 countries representing 4 WHO Regions (Europe, Eastern Mediterranean, South-East Asia and Western Pacific) showed an average of 8.7% of hospital patients had nosocomial infections.[5] The highest frequencies of hospital acquired infections were reported from hospitals in the Eastern Mediterranean and South-East Asia regions [11.8 and 10.0% respectively] with a prevalence of 7.7 and 9.0% respectively in the European and Western Pacific Regions.[6] A review of studies performed also revealed an extremely fragmented picture of the endemic burden of HAI in India.[7]

Many different pathogens may cause nosocomial infections 1 such as bacteria which are the most common nosocomial pathogens (eg. Staphylococcus aureus, beta haemolytic Streptococci, Pseudomonas, E.Coli, Klebsiella etc.); viruses (Hepatitis B and C viruses, Enteroviruses etc.); parasites and fungi (Candida albicans, Aspergillus spp., Cryptococcus etc.). A prospective study of 71 burn patients at Post Graduate Institute of Medical Education and Research (PGIMER) in Chandigarh found that up to 59 patients (83 per cent) had hospital-acquired infections: 35 per cent of pathogens isolated from wounds and blood were S. aureus, 24 per cent were P. aeruginosa, and 16 per cent were β-haemolytic streptococci.[8]

The most frequent type of infection in the mixed patient populations in developing countries was surgical site infections (29.1%), followed by urinary tract infections (23.9%), blood stream infections (19.1%), hospital acquired pneumonia (14.8%), and other infections (13.1%).[9] Diagnosis of hospital acquired infections includes a detailed physical examination and laboratory test of necessary samples or necessary investigation. The WHO study and others1 have also shown that the highest prevalence of nosocomial infections occurs in intensive care units and in different surgical and orthopaedic wards.

The development of a surveillance process to monitor nosocomial infection rate is an essential first step to identify local problems and priorities, and evaluate the effectiveness of infection control activity. Incidence study (longitudinal) i.e. prospective identification of new infections requires monitoring of all patients within a defined population for a specified time period. Patients are followed throughout their stay and sometimes after discharge.

In India, there are no mandatory reporting and recording systems for nosocomial infections both at the national and state level.[10] However, there is little doubt that the incidence of HAI has increased over the years and the problem is not less in this country than anywhere else in the world.

In such an overall perspective, with almost non-existent surveillance system for HCAI both at the national and state level, studies on hospital acquired infections at various geographical locations of this diverse country may reveal interesting findings to implement area and setting specific preventive/ control measures. Such kinds of studies are also limited in West Bengal. In this scenario, the present study on hospital acquired infections among patients admitted in ENT wards of North Bengal Medical College and Hospital was undertaken with the objectives to assess the background characteristics of the study population, to determine the incidence of hospital acquired infections among those admitted patients and to identify the different types of hospital acquired infections and the bacterial pathogens responsible for those infections.

Materials and Methods

An observational study with longitudinal design was undertaken during 6 months period (January 2014 to June 2014) among patients admitted in male and female ENT wards of North Bengal Medical College and Hospital (NBMCH), Sushrutanagar, Darjeeling district, West Bengal who were willing to give informed verbal consent. Patients developing any sign/symptom of infection within 3 days of admission (community

acquired infections) and who were discharged/ died within 3 days of admission were excluded from the study.

Sample size was calculated by estimating the incidence rate, with specified relative precision.[11]

$$n = \left(\frac{Z_{1-\frac{\alpha}{2}}}{\varepsilon} \right)^2$$

Where Ɛ = Relative precision, α = Alpha error

Estimating the incidence rate of hospital acquired infection to within 20% of its true value, with 95% confidence level;

Sample size was =1.96x1.96/0.2x0.2 = 97 when α = 0.05, Zα = 1.96

Attrition of sample population for lose to follow up, not given informed consent and inadequate culture material etc., an additional 10% was included. Thus final sample size became = 97 + 10% of 97 ≈ 107.

Prior institutional ethical clearance and informed verbal consent were obtained from the participants who were assured of anonymity and confidentiality of information collected. The individual study subject was briefed about the purpose of the study, possible investigation needed and the possible outcome.

On the starting day all the patients admitted at ENT wards of NBMCH (Average 14-20 per day) were first selected in the study. Data on background characteristics [like name, age, gender, religion, residence, socioeconomic status according to modified B.G. Prasad scale 201312, duration of preoperative hospital stay(days), total duration of hospital stay (days), cause of admission (diagnosis)] were collected by a pretested, predesigned semi-structured schedule.

Each patient was evaluated clinically for different symptoms like fever; purulent discharge, abscess, cellulitis at surgical site; increased frequency of micturition, burning sensation during micturition; cough, purulent sputum; or others, for first 3 days of admission. If he/ she developed any sign/ symptom within first 3 days, was excluded from the study as community acquired infection.

Rest patients (excluding community acquired infected cases) fulfilling the inclusion and exclusion criteria were included in the study. These patients were clinically examined daily for any sign/symptom of nosocomial infection [based on: Simplified criteria and Common Nosocomial infection sites (adapted from WHO, 2002),[1] starting from third day of admission to till discharge. If any of them developed any sign/ symptom, sample collection and necessary investigations of this patient were carried out based on clinical ground for e.g. blood sample in case of fever; urine specimen in c/o urinary symptom; surgical wound swab culture in c/o discharge or cellulitis at surgical site; chest X-ray in c/o respiratory symptom. Only bacterial pathogens were detected in different cultures.

Anyone diagnosed as a case of hospital acquired infection based on available investigation report, was followed up till discharge. In each week patients admitted on three days (Monday, Wednesday and Friday) have been included in the study and selected on the same basis as described above, while continuing follow up of previous sets of patients. Further inclusions of study subjects were continued consecutively, till required sample size has reached.. All cases of diagnosed nosocomial infections were treated subsequently.

Collected data were entered and analysed using IBM Statistical Package for Social Science version 20 (SPSS, Inc., Chicago, IL, USA). Descriptive statistics were performed. The results were recorded as frequencies, percentages and means ± standard deviations (SD).

Results

The study was conducted to determine the incidence of hospital acquired infections among admitted patients. Inclusion of the eligible study subjects from the admitted patients fulfilling the stated criteria was started on January, 2014 and it has been continued till desired sample size has been reached.

During that period a total of 223 patients were admitted in ENT wards, out of them 24 were discharged and 6 died within three days of admission. Four patients did not give informed consent. Among the rest 189 patients, total 77 developed signs / symptoms of community-

Table I: Background characteristics of the study population

VARIABLES	CHARACTERISTICS	NO.	(%)
Gender (n=107)	Male	49	45.8
	Female	58	54.2
Age groups (years) (n=107)	<15	13	12.1
	15-29	20	18.7
	30-44	31	29
	45-59	27	25.2
	≥ 60	16	15
Religion (n=107)	Hindu	70	65.4
	Muslim	26	24.3
	Christian	11	10.3
Residence (n=107)	Rural	62	57.9
	Urban	45	42.1
Socioeconomic class (n=107)	II	6	5.6
	III	51	47.7
	IV	36	33.6
	V	14	13.1
Mode of admission (n=107)	Referred	44	41.1
	Direct	63	58.9
Pre-operative stay (days) (n=77)*	<3	55	71.4
	≥3	22	28.6
Total duration of hospital stay (days) (n=107)	≤ 7	68	63.6
		39	36.4

**30 patients (5 non-operated cases and 25 cases operated on the day of admission) were excluded.*

acquired infections within 3 days of admission. Finally 107 patients were selected for the study based on their clinical ground. These 107 study participants were followed up for a total 797 patient days, however follow up period varied between patients to patients. Findings of these 107 study subjects are presented below in different sections:

1. Background characteristics of the study subjects
2. Hospital acquired infections and its types
3. Clinical features and necessary investigations

The present study revealed that 45.8% of the study populations were males and 54.2% were females. Maximum study subjects (29%) belonged to 30-44 years of age groups and mean age was 38.5 ±17.83 years. Majority of the study population were Hindus (65.4%); residing in rural area (57.9%); belonged to socioeconomic (S.E.) class III according to modified B. G. Prasad scale 2013 (47.7%); admitted directly in the hospital (58.9%). Most of the study participants (71.4%)

Table II: Distribution of study subjects according to development of hospital acquired infections (HAI). (n=107)

HOSPITAL ACQUIRED INFECTIONS	FREQUENCY	PERCENT
Positive	21	19.6
Negative	86	80.4
Total	107	100

had duration of preoperative hospital stay less than 3 days and mean duration of preoperative stay was 2.04 + 1.52 days, whereas majority of the admitted patients (63.6%) stayed in the hospital for less than or equal to 7 days and mean duration of total stay was 2.04 + 1.52 days. (Table I) Out of the 107 patients, 21 (i.e. 19.6%) developed any hospital acquired infections. (Table II)

Different rates of hospital acquired infections (HAI):

- Cumulative incidence rate (Attack rate)[2]

$$= \frac{\text{Number of new infections acquired in a period}}{\text{Number of patients observed in the same period}} \times 100$$

$$= \frac{21}{107} \times 100$$

$$= \mathbf{19.6\%.}$$

- Incidence density 2

$$= \frac{\text{Number of new infections acquired in a period}}{\text{Total of patient-days for the same period}} \times 1000$$

$$= \frac{21}{797} \times 1000$$

$$= \mathbf{26.35 \text{ per } 1000 \text{ patient days.}}$$

Out of total 21 hospital acquired infected cases, surgical site infection was commonest (57.2%) followed by urinary tract infection (23.8%) and blood stream infection (19.0%) respectively. (Fig. 1)

Table III: Distribution of symptomatic study subjects according to nature of signs/symptoms developed after three days of admission. (n=63)*

NATURE OF SIGNS/ SYMPTOMS	FREQUENCY	PERCENT
Fever	26	41.3
Surgical wound discharge	12	19
Urinary symptom	23	36.5
Respiratory symptom	9	14.2

It has been found that, 63 (58.8%) out of total 107 study participants had developed any sign/symptom after three days of admission. Among them 41.3% developed fever, followed by 36.5% urinary symptom, 19% surgical wound discharge and 14.2% of them developed respiratory symptom after three days of admission. (Table III)

The symptomatic patients underwent different investigations accordingly. Fig. 2 shows that 4 (15.4%) out of 26 blood cultures, 12 (100.0%) out of 12 surgical wound swab cultures and 5 (21.7%) out of 23 urine cultures were found to be positive. All chest X-ray reports found to be negative. Although more than one investigation needed in few patients according to presence of signs/ symptoms, but a single positive result has been found in each 21 cases e.g., if a patient complained of fever and urinary symptoms; blood culture as well as urinary culture were performed but either positive blood culture or positive urine culture was found.

Only bacterial organisms were detected in different cultures. Most commonly occurring pathogens found as Pseudomonas and Klebsiella (both in 23.8% cases), followed by Staphylococcus aureus and E. coli (both in 19% cases), followed by Staphylococcus epidermidis (in 9.6% cases) and Streptococcus pneumoniae (in 4.8% cases). In case of blood stream infections;

Staphylococcus aureus, Staphylococcus epidermidis and Streptococcus pneumoniae were found. Surgical site infections revealed Pseudomonas aeruginosa, Klebsiella pneumoniae and Staphylococcus aureus. Escherisia coli and Klebsiella pneumoniae were the causative organisms for urinary tract infections .(Table IV)

Discussion

Hospital acquired infections (HAIs) are becoming increasing problems for hospitalized patients.[13] They are major causes of death and disability worldwide. Thus a continuous surveillance and monitoring system is imperative for determining the extent of the problem and its effective prevention and control. In this context the findings of the present study on incidence of hospital acquired infections among admitted patients in ENT wards of North Bengal Medical College and Hospital can be interpreted.

Among the total 107 study participants 45.8% were male and 54.2% were female. (Table I) As the study was carried out simultaneously in both male and female surgical wards, there was not much difference in gender wise distribution of study subjects. Mean age of study participants was 38.5±17.83 years. This age distribution may be due to preponderance of surgical interventions in the age group of 30-59 years. A study in Ethiopia also found mean age of admitted patients in surgical wards and surgical intensive care unit (SICU) as 38.02 ±14.82 years.[14]

58.9% of study population admitted directly in the hospital and 41.1% of them were referred from other health care facilities. (Table I) This large number of referral may be due to the specific geographical location of this tertiary care Medical College Hospital in North Bengal catering to five districts along with neighbouring states and adjacent countries like Nepal, Bangladesh.

In this study majority of the patients (71.4%) stayed preoperatively in the hospital for <3 days with mean duration 2.04 + 1.52 days. (Table I) This result corroborates with the findings by Ancheril, where 71.9% of patients having preoperative hospital stay of less than 3 days with mean stay of 3.1 days.[10]

It was shown in Table I that; most of the study subjects (63.6%) stayed in the hospital for less than equal to 7 days with mean duration of stay was 7.45 + 2.60 days. This mean duration is consistent with the average length of stay in surgical ward in Indian Hospital (7.2 days).15

According to a WHO report hospital acquired infection rates in developing countries vary from 5.7% to 19.1% (but mostly >10%).7 Present study also found that cumulative incidence rate (attack rate) of hospital acquired infections was 19.6% (Table II) and incidence density was 26.35 per 1000 patient days. Possible determinants of this burden of health-care-associated infection in this facility may include : inadequate environmental hygienic conditions; poor infrastructure; insufficient equipment; understaffed facilitiy; overcrowding; paucity of knowledge and improper application of basic infection-control measures.

Almost similar result i.e. HAI rate of 21.9% has been found by Patel et al (2006) in a prospective study of hospital acquired infections among 100 admitted patients in the general surgical wards of a tertiary care centre hospital in Ahmedabad, Gujarat, West India.[16] However, the present HAI incidence rate of 19.6% does not corroborate with a study by Agarwal et al (2006) in respiratory intensive care unit of PGI Chandigarh, where HAI rate was found to be 33.5%.[17] Possible reasons behind this elevated rate may be, patients in intensive care units are more prone to HAI compared to surgical patients.

In contrast, Rathore et al. (2011) revealed lower incidences (10.93%) of nosocomial infections among patients admitted in medicine wards of Nariender Mohan Hospital, Ghaziabad, India.[18] This lower infection rate is reported to be due to a presence of an effective infection control program run by the hospital infection control committee. In other countries, higher infection rate was observed by Faruquzzaman (2008),[19] Ogwang et al. (2010).[20] In this study only bacterial pathogens were assessed in infections without detection of fungal and viral pathogens due to unavailability of technology and laboratory facilities. On the other hand most of above mentioned studies included fungi and viruses in their study.

A lower infection rate was reported by N. Endalafer

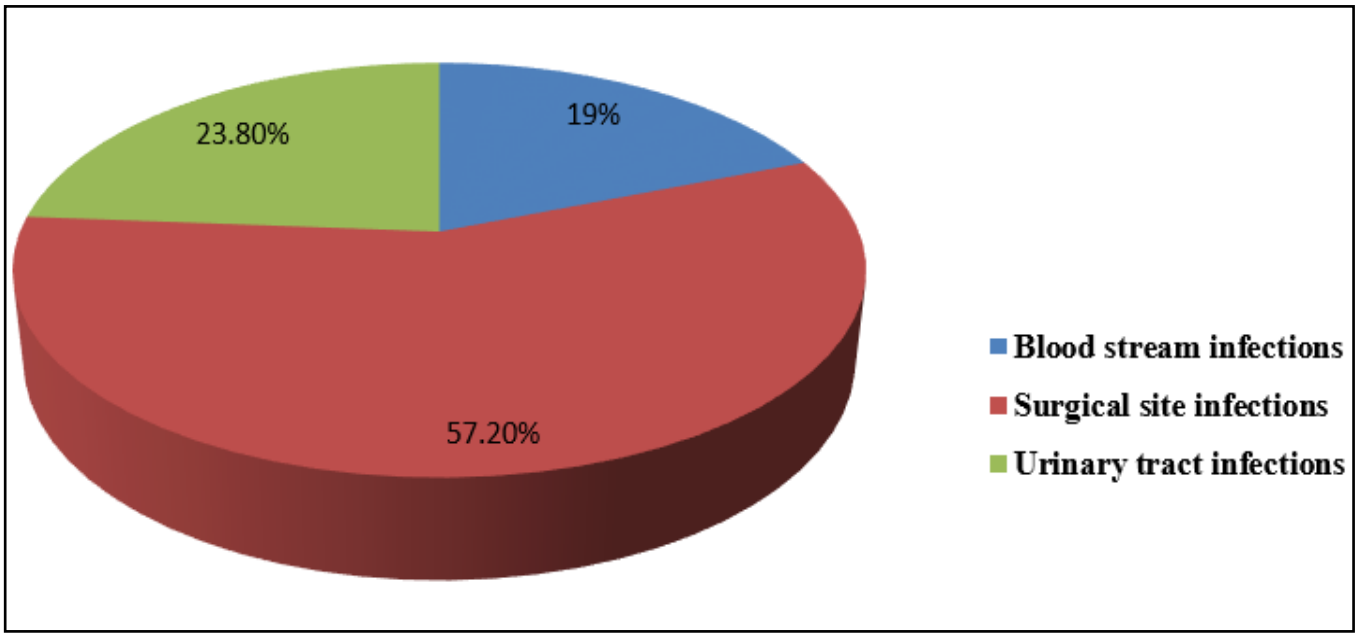

Fig. 1. Pie diagram showing different types of hospital acquired infections

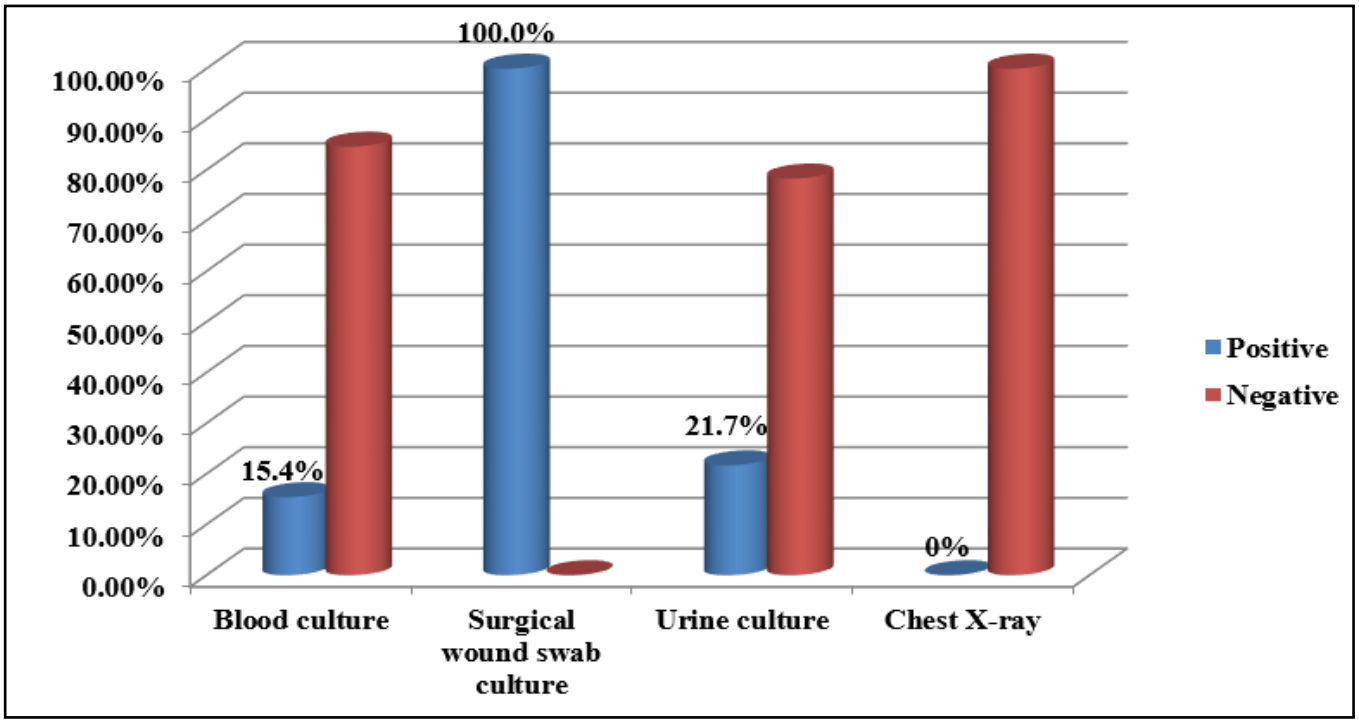

Fig. 2. Multiple Bar Diagram showing distribution of symptomatic patients according to results of different types of investigations.

Table IV: Distribution of major pathogens according to the sites of hospital acquired infection.

NAME OF PATHOGENS	BLOOD STREAM INFECTION	SURGICAL SITE INFECTION	URINARY TRACT INFECTION	TOTAL NO (%)
Pseudomonas aeruginosa	0	5	0	5(23.8)
Klebsiella pneumoniae	0	4	1	5 (23.8)
Staphylococcus aureus	1	3	0	4 (19.0)
Escherichia coli	0	0	4	4 (19.0)
Staphylococcus epidermidis	2	0	0	2 (9.6)
Streptococcus pneumoniae	1	0	0	1 (4.8)
Total	4	12	5	21 (100)

(2008),[14] Cotter et al. (2011).[21] This decrease in the rate of nosocomial infections in those health care settings may be paralleled to paying attention to well-established processes for decontamination and cleaning of soiled instruments and other items, followed by sterilization and high-level disinfection processes and improving safety in operating rooms and other high-risk areas where the most serious and frequent injuries and exposures to infectious agents occur. Another factor that can account for the lower infection rate may be due to the availability of high number of health personnel and superior setup of the hospital.[14]

In this study out of total 21 hospital acquired infected cases, surgical site infections/ SSI was commonest (57.2%) followed by urinary tract infections/ UTI (23.8%) and blood stream infections/ BSI (19.0%) respectively. (Fig.1) Since all the patients excluding only 5, were exposed to surgical procedures, this infection can be acquired from contaminated surgical equipments or from health care workers. Also the susceptibility to surgical wound infections were enhanced by poor wound care and prolonged hospitalization. Urinary tract was the second infection site in the present study. Since, some of the admitted patients had urinary catheters and catheterization increased the rate of infection. The other common infection was BSI. Many intervention measures which were risk factors for BSI frequently done in the ENT wards like use of invasive-devices (e.g. venous catheterization, tracheostomy, urinary or nasogastric tubes); suctioning of material from the throat and mouth; the utilization of drugs such as sedatives; or the influence of surgical procedures.

According to WHO also, the most frequent type of infection in the mixed patient populations in developing countries was SSI (29.1%), followed by UTI (23.9%), BSI (19.1%), Hospital Acquired Pneumonia/HAP (14.8%) and other infections (13.1%).7 The pattern of nosocomial infections in present study also matches with the study by Patel et al. in surgical wards of tertiary care hospital in Ahmedabad.[16]

In this study 63 (58.8%) out of total 107 study subjects had developed any sign/symptom after three days of admission. Most commonly presenting feature was fever (41.3%), followed by urinary symptom (36.5%), surgical wound discharge (19%) and respiratory symptom (14.2%) respectively. (Table III) Fever is a common symptom in majority of infections, although 4 out of 26 blood cultures found to be positive. (Fig. 2) Urinary organisms were detected only in 5 out of 23 urine cultures. (Fig. 2) Clinically,

discharges from postoperative surgical wounds were sufficient to diagnose SSI, but surgical wound swab cultures were performed for identification of causative organisms, therefore all 12 wound swab cultures found to be positive. (Fig. 2) Surprisingly all 9 patients with respiratory signs/symptoms had negative chest X-ray. (Fig. 2) Although more than one investigation needed in few patients according to presence of signs/ symptoms, but a single positive result has been found in each 21 cases. Possible reason may be the patient having multiple clinical features usually not developed all the features simultaneously. After appearance of first sign/ symptom and performance of necessary investigation, antimicrobials have been started before getting the result. Therefore second investigation showed bacteriologically negative result even though second sign/symptom aroused.

It was observed that; most commonly occurring pathogens were gram negative bacteria such as Pseudomonas and Klebsiella (both in 23.8% cases), followed by Staphylococcus aureus and E. coli (both in 19% cases), followed by Staphylococcus epidermidis (in 9.6% cases) and Streptococcus pneumoniae (in 4.8% cases). (Table IV) WHO also reported gram-negative rods as the most common nosocomial isolates in developing countries and the most frequent single pathogens were S. aureus in mixed patient populations.[7] However commonest single most organisms varied like Pseudomonas,[19] Klebsiella,[16] E.coli.[14]

Conclusion

Hospital acquired infections (HAI) develop in patients while receiving care in health facilities and represent one of the frequent preventable adverse patient outcomes in health care settings. By searching several studies in the scientific literatures, it can be stated that, the burden of HAI worldwide is very high in terms of morbidity, mortality, extra-costs, emotional stress and other outcome indicators. Surveillance systems for HCAI exist in several high-income countries but are virtually nonexistent in most low- and middle-income countries.

The present study found incidence rate of hospital acquired infections as 19.6% and incidence density as 26.35 per 1000 patient days. Surgical site infection was commonest and gram negative bacteria were most frequently occurring organisms. So this study can provide information for the prevention strategies of HAI at improved health care service level as well as it can help to raise interest to conduct further research in this field.

Thus even in a tertiary health care facility where most of the health care staff are well trained, hospital acquired infections rate could not be brought down to <10%. This might be because of extremely limited awareness of the problem, reluctance to take precautionary measures, lacking the maintenance of aseptic technique during invasive procedures, empirically misuse and overuse of antimicrobials and also very importantly precedence of other health priorities over patient safety considerations. Further researches on other causative agents and risk factors of HAI can help to identify specific preventive measures in future.

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A Cadaveric Study of Occurrence of Extralaryngeal Branches of the Recurrent Laryngeal Nerve with Reference to its Importance in Thyroid Surgery

Shantanu Nandy,[1] Anirban Banerjee,[2] Saumik Das[3]

ABSTRACT

Introduction:

Recurrent Laryngeal Nerve Palsy (RLNP) is the most common complication of thyroid surgery. Patients complain of hoarseness of voice and sometimes variable amount of respiratory distress due to palsy of recurrent laryngeal nerve (RLN), extra laryngeal branches of which are often ligated along with Inferior Thyroid Artery (ITA) during thyroidectomy. So prevalence and variable pattern of extra laryngeal nerve branches (ELNB) of RLN should be known to the thyroid surgeon to avoid post operative complications.

Materials and Methods

Dissection was carried on the neck of properly embalmed 25 adult cadavers including both sexes in the dissection hall to study extra laryngeal nerve branches (ELNB) of 50 RLN specimens.

Results

Out of 50 RLN, 13 nerves (26%) have ELNBs. Only in 4 cadavers (16%) they are bilateral. In 9 cases RLN branches were surrounding either single trunk of ITA or branches of the artery. In rest of the 4 cases ELNBs were passing entirely either in front or behind the ITA.

Conclusion

The gold standard for preservation of the RLN during thyroid surgery is still visual anatomical identification. Proper dissection and anatomical identification of the RLN and all its branches is very important prior to the clamping of the ITA and all its branches.

Keywords:

Recurrent Laryngeal Nerve; Thyroidectomy; Cadaver

There are many thyroid diseases where only pharmacological treatment is not sufficient and they require thyroidectomy. During the surgery, surgeon has to ligate both superior thyroid artery and inferior thyroid artery (ITA). As the ITA has variable relationships with Recurrent Laryngeal nerve (RLN) in trachea – oesophageal groove close to the lower pole of thyroid gland, the nerve becomes vulnerable while ligating the artery. Thus in post thyroidectomy patients recurrent laryngeal nerve palsy (RLNP) is a common complication.[1] So a surgeon must be aware of the variable relationship of RLN and ITA close to the lower pole of thyroid gland to avoid RLNP.[2]

The situation becomes more complicated for the surgeon if the RLN has extra laryngeal branches. In most of the cases the RLN trunk enters into the larynx after crossing the ITA and ramifies within the larynx. But it is

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Fig. 1. Incision lines drawn on the neck of cadaver

noticed that, while passing behind the cricothyroid joint RLN is often divided into 2 or 3 branches outside the larynx in relation with ITA. Injury to a small twig of these extra laryngeal nerve branches (ELNB) may result in voice changes.[6] In these cases surgeon requires very meticulous approach and precision to restore the nerve branches by identifying and exposing the nerve itself and all of its branches.[3,4]

Method and material

A cross sectional study was conducted where right and left side of the neck of 25 properly embalmed donated cadavers were dissected within a span of 2 years. Both male and female adult cadavers were dissected. Only fresh cadavers were chosen excluding the : a) cadavers which were already dissected, b) cadavers with scar in the neck, c) cadavers with prior neck surgery.

Cadavers were kept in supine position on dissection table and cervical region were extended. Incision lines were drawn by chalk. A transverse incision was made at

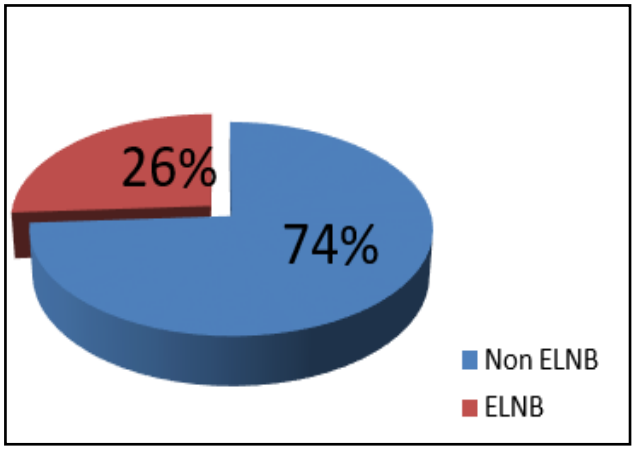

Fig. 2. 26% RLNs having extra laryngeal branches among 50 nerve specimens

the level of upper border of thyroid cartilage joining the posterior margins of the sternocleidomastoid muscles of both sides. Another transverse incision was made along upper border of clavicle passing through the jugular notch. Midpoints of these 2 incisions are joined by a vertical incision along midline. Sometimes if necessary, over exposure was done by dissecting the sub mandibular region. (Fig.1) After retracting skin, superficial fascia along with platysma, superficial structures including anterior jugular veins and the anterior strap muscles of the neck were dissected and retracted.

Sternocleidomastoid (SCM) muscle, Carotid arteries and internal jugular vein were exposed and were retracted to explore the vagus nerve in between and deep to the artery and the vein to point out the origin of RLN. Then the lower pole of thyroid gland was retracted along with the trachea just deep to the gland. In the tracheo - oesophageal (TE) groove in between lateral surface of the trachea and oesophagus, we searched for the RLN lying in close relation with ITA. The nerve is traced upto its point of origin for confirmation.[5] Thyroid gland was kept in situ to avoid injury of the vessels and nerves.

Results

Among the 25 cadavers dissected most of were male constituting 68% (17) and rest of 32% (8) were female. We got 50 nerve specimens, of which 13 RLNs were divided into branches before entering the larynx. So the

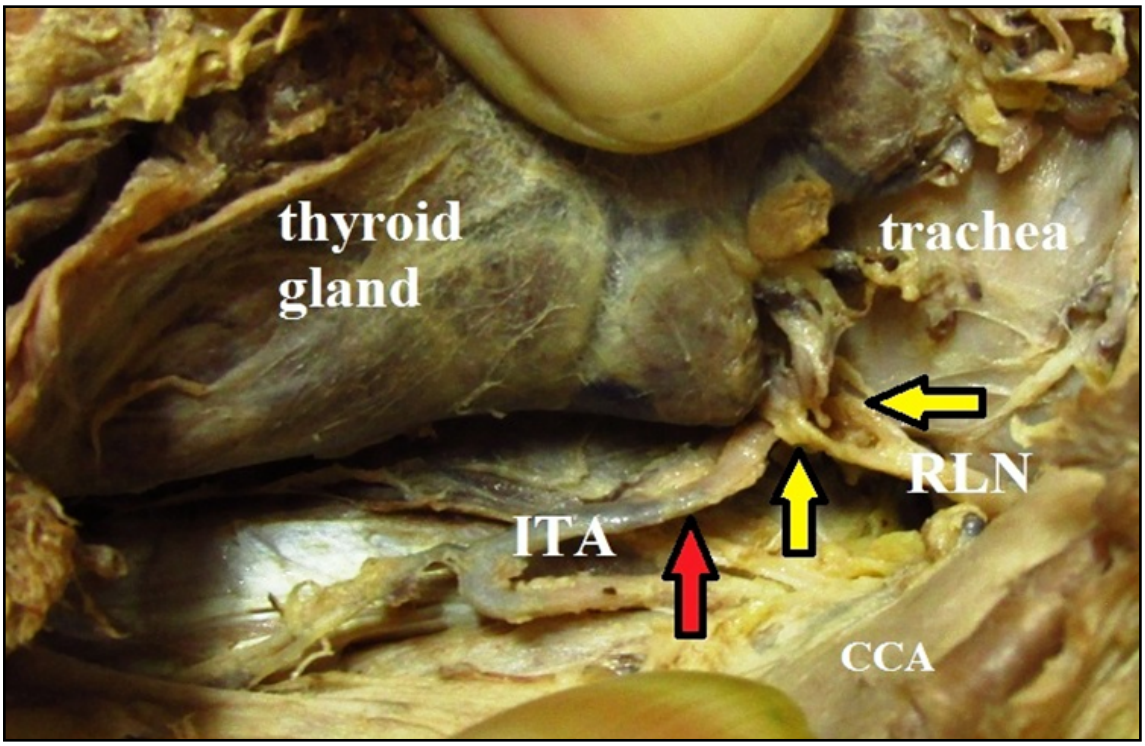

Fig. 3. Extralaryngeal nerve branches of RLN (yellow arrow) surrounding single trunk of ITA (red arrow). CCA- common carotid artery.

occurrence of extra-laryngeal nerve branches (ELNB) in our study is 26% (13 of 50). (Fig. 2) In these specimens the RLN is bifurcated or trifurcated. But not all of them were intermingling with the branches of ITA. In nine (9) cases RLN branches were surrounding either single trunk of ITA or branches of the artery. (Fig. 3) In rest of four (4) cases, RLNs with its branches are passing either anterior to or posterior to the ITA as a whole without intermingling with each other. (Fig. 4)

The 13 nerves with ELNB were found in 9 cadavers. So 36% (9 of 25) cadavers presented with ELNB. Among them bilateral ELNB are present in 4 cadavers (16%) only.

Discussion

The variable relationship between RLN and ITA is a topic of research since the time of Theodor Kocher, who is known as the father of thyroid surgery.[6] The ultimate goal of every researcher and thyroid surgeon is to reduce the rate of post thyroidectomy RLNP and thus to restore the voice and airway of the patients. According to the 'Farquharson's textbook of operative general surgery', in cases of bilateral RLNP during thyroidectomy, permanent tracheostomy is the way to restore airways unless the damage is no more than a temporary neuropraxia.[7] It reflects why we are so concern about RLN and its damage.

This potentially catastrophic complication of thyroid surgery can occur permanently in 0.3–3% of cases, with transient palsies in 5–8%.[8] Dr Frank Lahey was first to introduce some improvised method for ligation of ITA, by which he recorded a nerve palsy rate of only 0.3%.[6,9]

But still the overall rate of RLNP is high. According to Titche, thyroidectomy accounts for 35.71% of surgical causes of injury to the RLN, and accounts for 3.73% of all causes.[10] In the various studies the incidence of injury to the RLN in thyroidectomies ranges from 0.5 to 12%. Frequency of this injury is more while ligating ITA and its branches.[11,12,13]

To change this grievous scenario constant emphasis is given on variation of RLN and its extra laryngeal

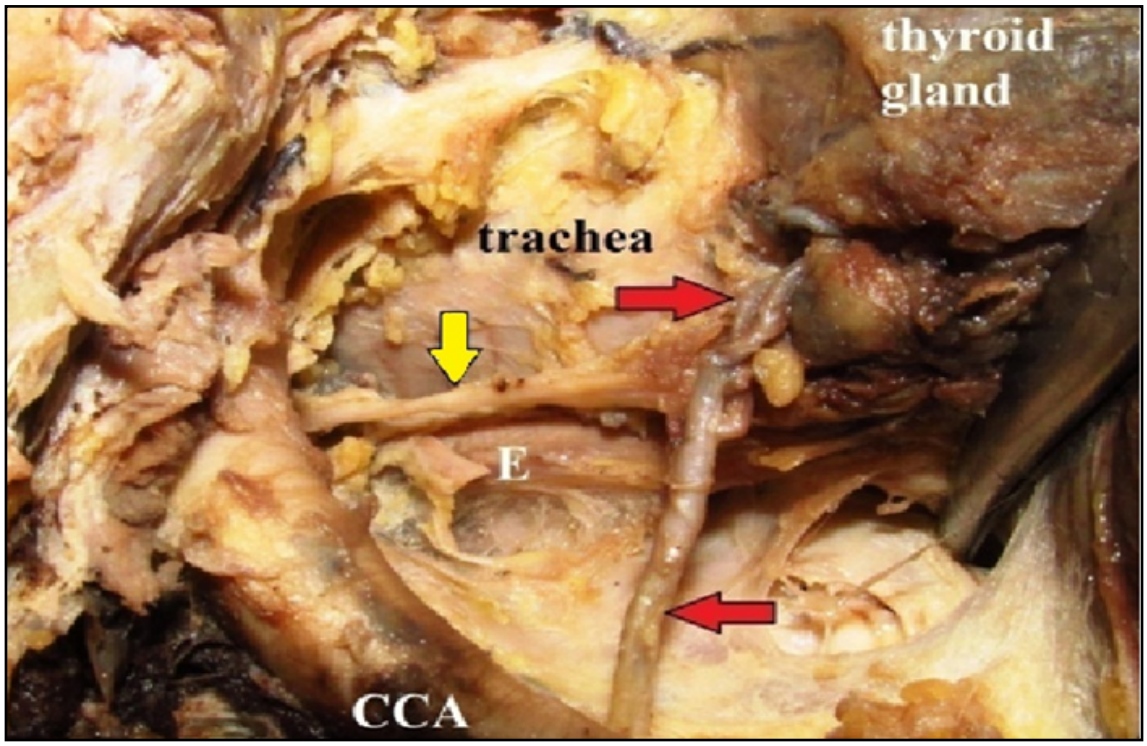

Fig. 4. FAN SHAPED extralaryngeal nerve branches of RLN (yellow arrow) GOING ENTIRELY BEHIND the ITA branches (red arrow). CCA- common carotid artery.

branches. A study by Ozer Makay et al. on 253 adult patients undergoing thyroid surgery revealed 24.1% RLNs are either bifurcated or trifurcated, which is close to our data 26%.[14] Among 57 RLNs which were bifurcating, only 17.5% (n=10) were bilateral, which is also very close to the data we got (16% cadavers with bilateral ELNB). Though there are other studies in which occurrence of RLN is either more or less.

In 3 separate studies by Nemiroff and Katz et al. 153, 1177, and 721 RLNs were observed of which 41.2%, 63% and 58% cases ELNBs were reported respectively.[15,16,17] A study by Kandil et al. in 99 patients undergoing thyroidectomy 137 RLNs were observed among which 46 RLNs (34%) bifurcated as ELNBs among which bilateral bifurcation occurred in 12 (27%) nerves.[18]

On the other hand, Jacob et al. found that ELNB (bifurcation) was present in 14.8% cases. The study also noticed that 44.4% of the ITA was branched in two. This crucial and difficult situation has a higher likelihood of nerve injury if the surgeon is not aware of the branching variations of the ITA and the RLN.[19]

In an Indian study by Pradeep et al. on 584 RLNs, two ELNBs in 29.11% cases and three ELNBs in 1.36% cases were reported, which is close to our study result.[20]

This similarity points towards a regional specificity of ELNB which should be a research topic for future researcher. But due to less number of data we could not confirm it.

The variable rate of prevalence of ELNB of RLN reflects that it is very difficult to draw any particular pattern of occurrence of ELNBs, ultimately leaving no way for the surgeons to be more cautious about the RLN and its branches during ITA ligation.

But it is evident that regarding extralaryngeal branching of RLN, bifurcation is the most common type so far reported. According to 'Gray's Anatomy' and 'Last's Textbook of Anatomy' – whenever RLN is bifurcating outside the larynx, the anterior branch is mainly motor while the posterior branch is mainly sensory.[21,22] Researchers also established the fact by IONM (intra operative nerve monitoring) method that

in almost 100% cases anterior branch of bifurcated RLN has the motor fibres and the posterior branch carries sensory fibres.[18, 23]

Contrary to this belief, some researchers using modern nerve signal recording device, recorded 1.3% to 11.5% of posterior ELNBs carry motor fibres along with the anterior branch.[24,25] This striking difference of results between old and new studies is achieved definitely by using more sensitive machines to record motor nerve signal. It is a very significant finding as it will compel the surgeons to take care of both of the ELNBs and not to give the emphasis only on the anterior branch, which will ultimately reduce the prevalence of RLNP.

Conclusion

So even after trying various methods like IONM (intra operative nerve monitoring), the gold standard for preservation of the RLN during thyroid surgery is still visual anatomical identification. Proper dissection and anatomical identification of the RLN and all its branches is very important prior to the clamping of the ITA and all its branches. Other techniques which aim to preserve the RLN may be used only as an adjunct to the gold standard. In a setting where advanced technologies are not available, the surgeon must rely on the knowledge about the variations in the neurovascular anatomy of the thyroid gland to prevent complications of surgery.[19, 26, 27]

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Comparative Study of Infiltration of Lidocaine with Adrenaline versus Sterile Water in Type 1 Tympanoplasty Performed under General Anaesthesia

Santosh Uttarkar Pandurangarao,[1] Sridurga Janarthanan[1]

ABSTRACT

Introduction:

It is a common practice to infiltrate 2% lignocaine with 1:2,00,000 adrenaline for Type 1 Tympanoplasty, even when the surgery is done under general anaesthesia. The purpose of this study is to evaluate the necessity of infiltration of lidocaine with adrenaline (2% lidocaine with 1:2,00,000 adrenaline) in Type 1 Tympanoplasty surgeries performed under general anaesthesia in terms of per-operative bleeding and post-operative pain relief.

Materials and Methods:

A double blinded, prospective randomized comparative study was conducted in a tertiary care centre. A total of 50 patients planned for Type 1 Tympanoplasty under general anaesthesia, for chronic otitis media, inactive, mucosal disease were selected and divided into two groups randomly. Group A (25 patients) received local infiltration of 2% Lidocaine with 1:2,00,000 adrenaline and Group B (25 patients) patients received infiltration of sterile water. The per -operative bleeding and post-operative pain relief were assessedat 2nd, 4th and 6th post-operative hour in both the groups and the results were analysed.

Results:

P value for per operative bleeding was <0.77 (non-significant). And the P value for post-operative pain relief at 2nd hour was <0.002 (significant). But the P value for 4th (<0.133) and 6th (<0.358) post-operative hours were not significant.

Conclusion:

Infiltration of 2% lidocaine with 1:2,00,000 adrenaline, doesn't have any significant impact in per-operative bleeding and post-operative pain relief at 4th and 6th hour. But there is a significant pain relief, for 2 hours after surgery, when 2% lidocaine with 1:2,00,000 adrenaline is used for infiltration.

Keywords:

Lidocaine; Infiltration, Anesthesia, General; Tympanoplasty

In Otolaryngology the quality of anaesthesia is important, as it determines the field of surgery and hence it's outcome.

Type 1 Tympanoplasty is a common surgery, performed for chronic otitis media in inactive mucosal type, where there is tympanic membrane perforation with intact ossicular chain. The procedure includes inspection of middle ear cleft with closure of tympanic membrane perforation with a graft (most commonly used graft is autologous temporalis fascia).

It is a common practice to infiltrate lidocaine with adrenaline (2% lidocaine with 1:2,00,000 adrenaline), even when surgeries are performed under general anaesthesia, and lidocaine is merely considered to be a carrier of adrenaline.[1]

The purpose of this study is to evaluate the necessity of infiltration of lidocaine with adrenaline (2% lidocaine with 1:2,00,000 adrenaline) in Type 1 Tympanoplasty performed under general anaesthesia in terms of per-operative bleeding and post-operative pain relief.

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Fig. 1. HMT company weighing apparatus

Materials and Methods

This is a prospective, randomised, double blinded, comparative study, done in a tertiary care hospital. After obtaining an institutional ethical committee clearance, this study was conducted on 50 patients, who were willing to participate in the study. A written and oral consent was obtained from the patients. The study period was between October 2016 to October 2017.

50 patients who were undergoing Type 1 Tympanoplasty under general anaesthesia, between the age group of 17 to 60 years were included in the study. These patients were randomised into two groups, Group A - the patients with even serial numbers and Group B - patients with odd serial numbers. Group A - 25 patients were infiltrated with 2% lidocaine with 1:2,00,000 adrenaline and Group B - 25 patients were infiltrated with sterile water infiltration.

Patients with co-morbid conditions were excluded from the study. After obtaining the background data from the patients, regular pre-operative investigations were done, including pure tone audiometry.

All these patients were operated by a single surgeon to maintain uniformity. The surgeon and the assisting staff on one side, and the person who measured the intra operative blood loss and post-operative pain score (using VAS) were blinded. Hence making the study double blinded.

General anaesthesia was induced with 0.05mg/kg body weight of midazolam, 2 mg/kg body weight of fentanyl and 2 mg/kg body weight of propofol. Then, preoxygenation with facemask ventilation was given. Patients were paralysed with vecuronium at the dose of 0.05 - 1 mg/kg. Endotracheal intubation was done with appropriate size endotracheal tube. Anaesthesia was maintained with nitrous oxide and oxygen at the ratio of 1:2 along with 2% isoflurane/halothane. Vitals were monitored throughout the surgery. The intra operative Blood Pressure was maintained between 100 – 110 mmHg (systolic) and 60 – 70 mmHg (diastolic).

Type 1 Tympanoplasty was done by post aural approach. Patients under Group A were infiltrated with 2% lidocaine with 1:2,00,000 adrenaline, in post

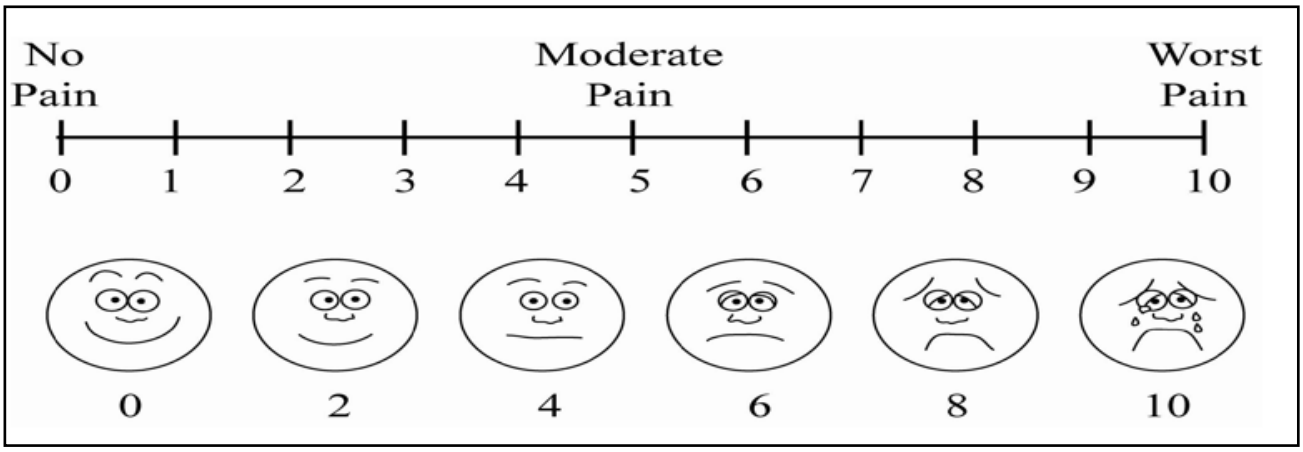

Fig. 2. Visual analogue scale

Table I: Duration of surgery in Group A and Group B

DURATION OF SURGERY(MINS)				
GROUPS	MEAN	STD. DEVIATION	T VALUE	P VALUE
Group A	72.4	15.75	0.73	P<0.470
Group B	69.4	13.25		

auricular region and in external auditory canal around 6 to 8 ml (according to the body weight of the patient). Whereas, patients in Group B were infiltrated with 6 to 8 ml of sterile water.

The per operative bleeding was assessed under aseptic precautions, by measuring the difference of weight between blood stained gauze and dry gauze used during surgery, (with the help of HMT company weighing apparatus with ISI mark and a sensitivity of 0.1gm to 500gm.), 1gm difference of weight was taken as 1ml blood loss (Fig. 1) and by measuring the quantity of blood in suction apparatus before and after surgery. [2]

The post-operative pain was assessed using visual analogue scale with 10 points at 2nd, 4th, and 6th post-operative hours (Fig. 2). No analgesics were given intra operatively and 6 hours post operatively in both the groups. Oral analgesics were started after 6 hours of surgery.

The time elapsed between intubation and extubation was considered as the duration of surgery. And the mean time was calculated in both the groups.

Results

The data was analysed using SPSS (version22.0) software. The age distribution of the study population was between 17 to 60 years, with a mean age of 29 years.

The number of female patients were more in both the groups. The total percentage of female patients were 64%.

The mean duration of surgery in Group A was 72.4 minutes and in Group B was 69.4 minutes. The P value was <0.470, which is not significant (Table I). This implies that there was no variation in the duration of surgery between both the groups.

The mean blood loss during the surgery in Group A was 27.6 ml and in Group B was 26.8 ml, with a P value of <0.77 (non-significant). (Table II)

The post-operative pain score was taken using visual

Table II: Total blood loss in Group A and Group B

TOTAL BLOOD LOSS(ML)				
GROUPS	MEAN	STD. DEVIATION	T VALUE	P VALUE
Group A	27.62	12.29	0.29	P<0.77
Group B	26.81	6.71		

Table III: Post-operative pain relief in Group A and Group B

POST OPERATIVE PAIN RELIEF					
VAS	**GROUPS**	**MEAN**	**STD. DEVIATION**	**T VALUE**	**P VALUE**
2nd Hour	**Group-A**	**1.6**	**0.71**	**-3.203**	**P<0.002**
	Group-B	**2.28**	**0.79**		
4th Hour	**Group-A**	**2.84**	**1.03**	**-1.527**	**P<0.133**
	Group-B	**3.2**	**0.58**		
6th Hour	**Group-A**	**4.2**	**1**	**-0.928**	**P<0.358**
	Group-B	**4.44**	**0.82**		

analogue scale (VAS) at 2nd, 4th and 6th post-operative hour, for the calculation of post-operative pain (Table III). The P value for the 2nd post-operative hour was <0.002 (significant). Whereas, the P value for 4th and 6th post-operative hour was <0.133 and <0.358, respectively (non-significant). (Fig. 3)

The p value results of duration of surgery and the total blood loss during the surgery was not significant, and it implies that the infiltration of 2% lignocaine with 1:2,00,000 adrenaline doesn't have any significant advantage in the variables mentioned above.

Whereas, the P value for the 2nd post-operative hour was significant implying that, the infiltration of 2% lignocaine with 1:2,00,000 adrenaline has an impact in decreasing pain 2 hours post operatively. And the 4th and 6th post-operative pain scores were not significant, implying that, the infiltration of 2% lignocaine with 1:2,00,000 adrenaline has an impact in decreasing pain till 2 hours post operatively, but not later than that.

Discussion

Lignocaine is an amide linked local anaesthetic agent, which has an intermediate potency and duration, when compared to the other local anaesthetic drugs. Percentage of lignocaine used for infiltration varies from 0.5 to 2%.[3] The duration of action of 2% Lidocaine for infiltrative anaesthesia is 1 hour without addition of adrenaline.[4] The onset of action of lignocaine is 3 minutes. Dose of lignocaine used for infiltration is 5mg/kg (without adrenaline) and 7mg/kg (with adrenaline).[5] The adverse effects of lignocaine are drowsiness, mental clouding, altered taste and tinnitus. Overdose causes muscle twitching, convulsions, cardiac arrhythmia, fall in BP, coma and respiratory arrest.

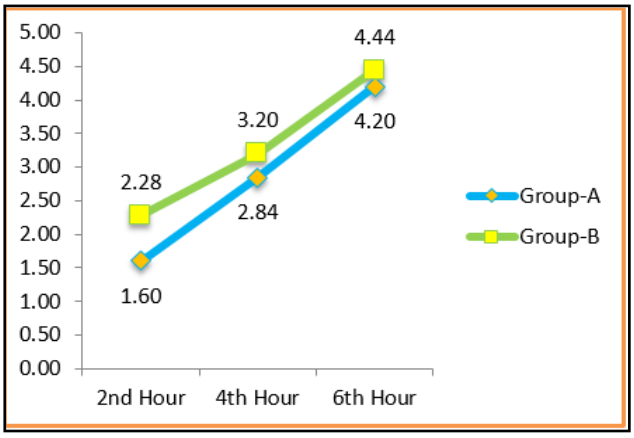

Fig. 3. Line diagram representing the post-operative pain score in Group A and Group B

Vasoconstrictors example, adrenaline in the concentration of 1:50,000 to 1:2,00,000 added with lignocaine. The advantages of adding are prolongation of the duration of action of lignocaine to 2 hours, decreases the systemic toxicity by decreasing the absorption into systemic circulation and provides a bloodless surgical field. But the disadvantages include increased chances of subsequent tissue edema and necrosis and poor wound healing. This may raise the BP and promote arrhythmia in susceptible individuals.[3]

Senthil, Samuel, Ramachandran showed that infiltration of 2% lidocaine with adrenaline has a significant impact over the 1st hour post-operative pain score and grade of bleeding in the surgical field, than using adrenaline alone in micro ear surgeries performed under general anaesthesia. But it does not have any influence over 4th and 24th hour post-operative pain score.[6] In our study we found that, infiltration of 2% lignocaine with 1:2,00,000 adrenaline has a significant impact over 2nd post-operative hour pain score, but no impact with total amount of blood loss and 4th and 6th post-operative hour pain score.

The post-operative pain relief after surgery is due the pre-emptive analgesic effect of the local anaesthesia. Woolf and Chong did a study on pre-emptive analgesia – treating post-operative pain by preventing the establishment of central sensitization. Peripheral tissue injury during surgery provokes two kinds of modification in the responsiveness of nervous system. One is peripheral sensitization i.e, a reduction in threshold of nociceptor afferent from peripheral terminal and second is central sensitization, an activity dependent increase in excitability of spinal neurons. These changes contribute to the post-operative pain. Pre-emptive analgesia prevents central sensitisation and hyperexcitability of neurons.[7] In our study we found that, the 2nd post-operative hour pain relief effect is due to pre-emptive analgesia of lignocaine.

Kaufman et al. stated that the concomitant administration of LA and GA is safer than GA alone as evidenced by greater physiological stability in patients. Consideration should be given to combining pre-emptive analgesics or the concomitant use of LA with lighter levels of GA or sedation. This strategy is directed at achieving the highest degree of efficacy while simultaneously limiting the amount and magnitude of unwanted adverse effects that are associated with using any technique alone. The evidence is convincing that pre-operative pre-emptive LA or analgesic used with GA provides improved patient care and should be routinely considered.[8] In our study also, we found the there was a good pain relief, post operatively in group of patients in whom we injected 2% lignocaine with 1:2,00,000 adrenaline.

The technique of infiltration of local anaesthetic drug has a bearing over the post-operative pain relief. Proper infiltration of local anaesthetic into the periosteum of the mastoid cortex needs a mention apart from regular subcutaneous infiltration. One of the reasons for persisting post-operative pain even after local anaesthetic infiltration is failure to infiltrate the periosteum.[9] The same effect was proved in our study, with a proper infiltration of local anaesthetic into the periosteum, by giving a good pain relief for 2 hours post-operatively.

Hence we attribute that, the decreased intraoperative bleeding with sterile water infiltration maybe due to the right plane of infiltration in the periosteum. And the significant post-operative pain score at 2nd post-operative hour is due to the pre-emptive analgesic effect of lignocaine infiltration.

In this study, an attempt is made to corroborate that, lignocaine with adrenaline infiltration does not have any added benefit in terms of per operative bleeding, when surgeries are performed under general anaesthesia. The limitation of our study is the sample size.

Conclusion

The infiltration of 2% lignocaine with 1:2,00,000 adrenaline in Type I Tympanoplasties, when done under general anaesthesia, has its own advantages and disadvantages. In our study we found that, there is no significant impact on infiltration of 2% lignocaine with 1:2,00,000 adrenaline in total blood loss during surgery and in 4th and 6th post-operative hour. But it is found that, 2% lignocaine with 1:2,00,000 adrenaline infiltration, gives good pain relief for 2 hours post operatively.

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Case Report

Chondroid Syringoma of Dorsum of the Nose

Netra Aniruddha Pathak,[1] Vidya Vasant Rokade, [1] Kiran Jayawant Shinde [1]

ABSTRACT

Introduction:

Chondroid syrigomas are rare, usually benign tumors occurring predominantly in the head and neck area. These are also known as mixed tumors of skin. Preoperative diagnosis is difficult and generally histopathology examination confirms the diagnosis. The usual presentation is that of a slowly growing mass.

Case Report:

A rare case of chondroid syringoma on dorsum of external nose in 30 year old female patient is presented.

Discussion:

Chondroid syringoma presents as slow-growing, painless, subcutaneous or intracutaneous nodule in middle-aged adult males. The tumor is often initially confused with more common dermatologic skin disorders such as sebaceous cysts, dermoid cysts, neurofibromas, dermatofibromas, basal cell carcinoma, histiocytoma and seborrheic keratosis. The treatment of choice is surgical excision with negative margins with follow-up to detect recurrences.

Keywords:

Deafness; Infant, Newborn; Hearing Tests; Evoked Potentials, Auditory, Brain Stem; Audiometry, Evoked Response; Otoacoustic Emissions, Spontaneous

Chondroid syringoma, a benign mixed tumor of the skin, is an uncommon and subcutaneous tumor composed of pleomorphic components of both epithelial and mesenchymal appearance which can be mistaken for other nodular disorders of the skin.[1,2] It originates in the sweat glands, usually occurring more in head and neck than in other areas.[3,4,5] The incidence of chondroid syringoma is low and ranges from 0.01 to 0.098 percent of all primary skin tumors and its incidence in men is twice that of women.[6,7,8] It is usually found as a painless subcutaneous mass and surgery is required when it causes cosmetic disfigurement. A malignant transformation is uncommon. As no characteristic clinical features are seen definitive diagnosis can be made only by doing a histopathological examination. We are presenting this case because of its rarity in females and unusual in its site of occurrence.

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Case Report

A 30-year-old female patient presented with a mass on her nasal dorsum growing slowly for the last 2 years. On examination, the lesion was a firm, non-tender, non-fluctuant, measuring 2.5 cm (width) by 2.5 cm (length). Overlying skin was tethered to lesion and its colour was changed (Fig. 1) She denied pain, trauma or previous surgery to the area. The remainder of the physical examination was within normal limits. Fine needle aspiration was performed narrowing the diagnosis to a chondroid syringoma. Surgical excision of the mass was performed under general anesthesia. The diagnosis of benign chondroid syringoma was made upon histopathological examination of the surgical specimen showing lace-like pattern of the tubule-alveolar structures. (Fig. 2) Negative margins were obtained on frozen section. Wide local excision of mass was done by keeping safety margin of 1.5 cm to prevent recurrence. The size of the defect was large enough to preclude primary skin closure. Hence the wound was closed with a paramedian forehead flap. (Figs. 3 & 4) The patient recovered uneventfully from surgery and after 6 weeks,

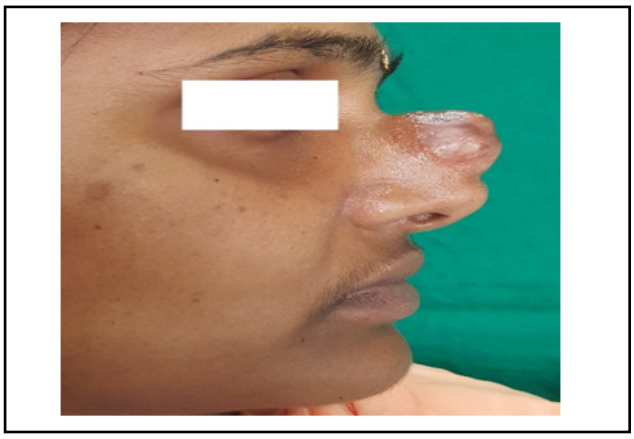

Fig.1. Mass on dorsum of the nose

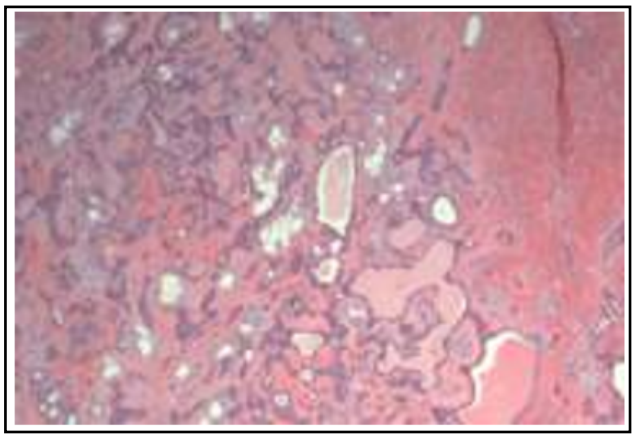

Fig.2. The lace-like pattern of the tubuloalveolar structures with the chondroid stroma is visible (H&E,40X)

the pedicle was divided and there had been no sign of recurrence on follow-up examinations.

Discussion

Chondroid syringoma presents as slow-growing, painless, subcutaneous or intracutaneous nodule in middle-aged adult males. The incidence reported in the literature ranges from 0.01 to 0.098 percent of all primary skin tumors. The tumor has been found on most parts of the body, with the majority involving the skin of the head and neck region. Most lesions are small and range between 0.5 to 3 cm.[6,7,8] In our study also it was painless slowly growing mass over dorsum of nose. Larger tumors are extremely rare as the tumors are usually excised before causing significant cosmetic and functional impairment. Larger lesions may become ulcerated and bleed. Chondroid syringomas do not present in a distinctive manner. As a result, the tumor is often initially confused with more common dermatologic skin disorders such as sebaceous cysts, dermoid cysts, neurofibromas, dermatofibromas, basal cell carcinoma, histiocytoma and seborrheic keratosis.[9] The definitive diagnosis is usually made upon histopathologic examination after surgery.

Malignant chondroid syringomas are extremely

Fig.3. Paramedian forehead flap for reconstruction

Fig.4. After excision of mass and complete closure

rare, occurring more commonly in females and on the extremities, with a high rate of metastasis to regional lymph nodes, bones, and visceral organs.[10] Atypical histological findings such as cytologic atypia, increased mitotic figures, infiltrative margins, and tumor necrosis are considered signs of malignant transformation.

Chondroid syringomas share similarities with pleomorphic adenomas which are mixed tumors that arise from the salivary glands. In contrast to pleomorphic adenomas, chondroid syringomas are thought to arise from sweat glands. Headington divided chondroid syringomas into apocrine and eccrine variants based on histological differences in the luminal morphology but there remains debate as to their exact origin. The treatment of choice is surgical excision with negative margins.[9,10] Important functional and aesthetic units should be maintained whenever possible. In our case we also did surgical excision with reconstruction for cosmesis.

The specimen should be examined closely to confirm the diagnosis and checked for malignancy. Routine follow-up is recommended as recurrence rates have been reported in 2.4 to 10 percent of cases. In most cases, recurrence occurs as a result of incomplete excision.

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An Interesting Case of a Butcher Who Attempted to Cut His Neck

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ABSTRACT

Introduction

Cut throat injuries are well recognized in homicide but less recognized in suicides. The incidence of suicide is increasing worldwide owing to the more stressful strenuous lifestyle and other risk factors like substance abuse. Suicide by incising one's own throat is associated with hesitation marks whereas homicidal wounds are not.

Case Report

We present an interesting case of a suicidal cut throat of the victim being a butcher who was on alcohol abstinence since 3 days with severe injuries of supraglottic larynx and cricopharynx, surprisingly without any evidence of hesitation marks. He underwent immediate neck exploration and suturing of the injured structures without the need of a tracheostomy.

Discussion

A multidisciplinary approach by Otolaryngologists, Psychiatrists, Intensivists, and Anaesthetists is required in the effective management of these victims. A thorough proper early assessment can totally avoid the need of tracheostomy which is recommended in practice, hence preventing complications arising out of this unnecessary but advocated procedure..

Keywords

Neck Injuries; Suicide; Treatment Outcome

Suicide is an act of taking one's life. Cut throat injuries are defined as incised injuries or those resembling incised injuries in the neck, inflicted by sharp objects. In the present scenario, the incidence of suicide is gradually increased worldwide owing to the more stressful strenuous lifestyle and other risk factors like substance abuse. This may result from accident/ suicide/ homicide and they are potentially life-threatening as many vital structures are present in this area.

Case Report

42 year old male butcher presented to the casualty with lacerated cut wound in the neck allegedly using a butcher's knife.

He was a chronic alcoholic since 15 years abstaining for past 3 days.

He was semiconscious, afebrile having tachycardia and was intubated in the casualty through the neck wound. (Fig. 1)

The neck had a laceration of about 7-8cm, clean, with extensive soft tissue injury and haemorrhage with exposed thyroid and epiglottic cartilage. No other injuries were noted. Surprisingly, no hesitation marks/ scars were present. (Fig. 2)

Patient was HBsAg positive. His preoperative haemoglobin was low, hence intraoperative blood transfusion was given.

On table, nasotracheal intubation was performed and a nasogastric tube was passed. Then the neck could be adequately exposed for repair. Intraoperatively, injury to the right lamina of thyroid cartilage, tear in anterior wall of cricopharynx, and a full thickness horizontal cut in the epiglottis was noted. Extensive tears in platysma, sternoscleidomastoid and infrahyoid muscles at the level of the thyroid cartilage were seen. (Fig. 3) Hence it was

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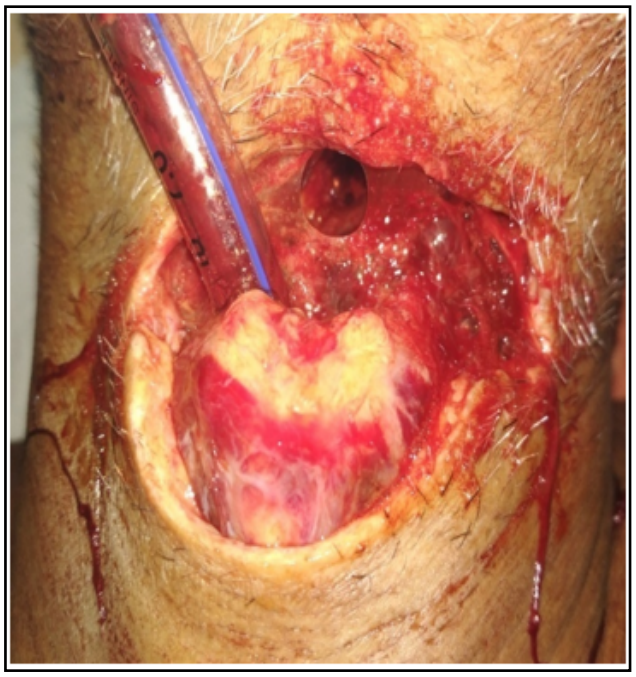

Fig. 1. Intubation through the neck wound

Fig. 2. Cut throat without hesitation marks

Fig. 3. The soft tissue injuries

Fig. 4. Immediate post-operative photograph

in zone II of neck injuries (Roon and Christensen's classification).

The wound was washed thoroughly with povidone iodine and hydrogen peroxide. Suturing was done for each anatomical structure in layers after debriding the exposed cartilage. The vocal cords were visualised and found to be intact. The perichondrium of the thryroid cartilage and epiglottis were sutured respectively. Subsequently, cricopharynx was repaired in layers for the mucosa, muscle and perichondrium. Carotid artery was unaffected bilaterally. Bleeding left superior thyroid vein was ligated. Minor bleeders in the neck were cauterised. The external laryngeal nerve was unexposed in the surgical field. Hemostasis was achieved and neck drain was inserted. Soft tissue, subcutaneous tissues and skin were closed in layers using 3-0 polyglactin (Vicryl®) and 4-0 monofilament nylon (Ethilon®) respectively. (Fig. 4)

Postoperatively, the patient maintained saturation well without any oxygen/ external support. The patient pulled his nasogastric tube spontaneously in the postoperative period, hence had to be kept on IV fluids and Total Pareneteral Nutrition by the Intensivist. He was monitored closely in the ICU and anti-suicidal measures were taken along with injections containing Calcium Pantothenate, Cyanocobalamin, Nicotinamide, Pyridoxine, Riboflavin, and Thiamine as active ingredients and injection haloperidol 5mg every 8th hourly as per Psychiatrist's advice. He was started on Injection Meropenem, Sulbactum for 5 days followed by Injection Amoxycillin-Clavulanate for 10 days. Gastroenterology, Neurology and Neurosurgery opinion was sought and was managed conservatively.

On postoperative day 3, drain was removed and on day 5, he was extubated successfully. He had a good cough reflex and voice quality. Nasogastric Tube was inserted using direct laryngoscope and feeds and medications were continued as per psychiatrist and dietician.

On postoperative day 8 he underwent suture removal and wound was healthy. He underwent daily compression dressings of the neck till postoperative day 14.

On postoperative day 14 the nasogastric tube was removed and the patient was started on sterile water and clear liquids.

He was started on soft diet from post op day 15. The postoperative period was uneventful and he was discharged.(Fig. 5)

Discussion

Suicide is one of the ten leading causes of death in the world with about one million deaths recorded annually.[1] After a thorough literature search using PubMed, EMBASE, Google Scholar, we came to a conclusion that cut throat injuries are less commonly reported in literature and suicidal cut throat injuries are very rare. No clear incidence rate has been documented anywhere. Often it is committed by individuals suffering from a mental illness; therefore it can be used as an index of mental health in a community.[2] The socio demographic factors are of particular interest in this case as it has been seen according to a study done by De et al that males accounted for about 86.06% of the cases.[3] People coming under the non-waged workers group are more commonly affected.[4] This is more commonly observed amongst the males since they are the breadwinners in most of the families. They tend to get mentally affected

Fig. 5. The wound healed uneventfully

when they are not able to make both ends meet and that provokes them to take the extreme step.[5] Alcohol consumption as seen in our case is also a prevalent factor and the ease of availability of the weapon such as rope, knife or gun acts as a catalyst in accelerating the process of being a victim to suicide.[2]

When suicidal cut throat injuries occur, a collective effort from the Otolaryngologist, Anaesthesiologist, Intensivist and Psychiatrist is needed to obtain a successful outcome.[6]

Neck is a Pandora's box with many structures like neurovascular bundles, larynx, trachea, esophagus and the spinal cord. Injury to any of these structures leads to life threatening emergencies for the otolaryngologists. The injuries are varied and depend upon the pattern, site, and depth of the cut on the neck.[2]

According to Roon and Christensen's classification,[7] neck injuries are divided into 3 anatomical zones:

Zone I – area between the clavicles and the inferior margin of cricoid cartilage. Structures include vertebral and proximal carotid arteries, major thoracic vessels, superior mediastinum, lungs, esophagus, trachea, thoracic duct and spinal cord.

Zone II – area from the inferior margin of cricoid cartilage to the angle of mandible. The carotid and vertebral arteries, jugular veins, esophagus, trachea, larynx and spinal cord are found in this zone.

Zone III – area located between the angle of the mandible and the base of the skull. It includes the carotid and vertebral arteries, pharynx and spinal cord.

Unlike Zone II, Zones I and III are protected by bony structures making Zone II more vulnerable to injuries. Most of the zone II injuries are associated with laryngeal injures which was present in this case as well.

In this case that we are reporting, as soon as the victim arrived at the casualty, the anaesthesiologist secured the airway, the otorhinolaryngologist assessed the injury and surgically repaired the severed tissues with the aim of restoration of breathing, swallowing and phonation and the psychiatrist along with intensivist provided adequate care and supervision. This is consistent with what has been advocated by Adoga.[2]

While securing an airway, orotracheal intubation is preferred ideally in the awake patient which is followed by the insertion of a tracheostomy tube through the transected portion of the trachea if a transection is present. Few are of the opinion that this could be dangerous as it can damage the already injured larynx or increase the chances of aspirating vomitus, blood or secretions.[8] There are also reports that in severe airway compromise, the use of flexible fibreoptic laryngoscope to intubate the trachea following a cut throat injury can be done[9] but in our case a gentle attempt to insert the tube through the orotracheal route was done with minimal manouvering from the external neck wound.

Zone II injuries are usually easily managed with neck extension provided there is no contraindication.[10]

According to Iseh K.R et al, pharyngeal, hypopharyngeal and laryngeal mucosal lacerations should be repaired within 24 hours.[11-13] This patient presented to us within 6 hours and hence the outcome was better after primary repair, as the time elapsed before repair of layngeal mucosal lacerations has an effect on both airway stenosis and on voice restoration,[14] hence an additional procedure of tracheostomy which is advocated by many was avoided successfully.

Pharyngocutaneous fistula is a feared complication in such a situation. Care must be taken to prevent this complication while carrying out pharyngeal/ hypopharyngeal repair. This needs good knowledge of the anatomy of the neck and meticulous approximation of tissues and the use of a nasogastric tube as was inserted in our case, so as to avoid oral feeding for a period of 7-10 days.[2]

Above all, we need to focus on the prime motive of the patient which leads to this state. Mental health intervention by identifying the disorders like depression, substance abuse which was alcohol dependence in our case, schizophrenia etc. needs to be addressed appropriately.

Even after discharge from otorhinolaryngological care, individuals should be closely followed and supervised in order to prevent another attempt which may lead to death in approximately 25% cases according to a study done by Amadasun.[15]

Conclusion

Suicidal cut throat injuries account for a sizeable number of deaths and hence is an important cause of morbidity and mortality. A thorough proper early assessment can totally avoid the need of tracheostomy which is recommended in practice, hence preventing complications arising out of this unnecessary but advocated procedure. Such injuries can be managed adequately with the help of endotracheal intubation reserving tracheostomy only in case of dire emergencies. This case demonstrates the importance of early presentation, immediate and timely management by the intensivist, anaesthesiologist and the otolaryngologist in close collaboration with the psychiatrist to offer a successful outcome to the patient and also the need to promptly identify the triggering factor for the condition and address the same.

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Tongue Entrapment in a Plastic Bottleneck

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ABSTRACT

Introduction

Oral foreign bodies and perioral injuries are common occurrence among paediatric population. These may range from benign occurrences to those that may threaten the airway. One such injury is tongue entrapment into objects like plastic bottle neck. Tongue entrapment in bottle neck is rare with very few cases reported in literature.

Case Report

A case of a 9-year old mentally retarded male child with tongue haemangioma who got his tongue tightly entrapped inside a plastic bottle neck is presented. Since such cases are very rare, treatment often requires creative and novel approach to ensure safe removal of constricting object without causing any injury to surrounding structures. When conventional methods using Mayo's scissors failed to cut open the bottle neck, we used Gigli saw wire in a safe manner to cut it open. It took a few minutes to relieve the entrapment of tongue without traumatising the surrounding structure.

Discussion

This case highlights the result of careless and often dangerous play and misadventures of children and the challenge of management. It calls for vigilance and close supervision of children by caregivers at home and at school. Early presentation, immediate intervention and treatment can prevent grave consequences.

Keywords

Tongue Entrapment; Child

Peri-oral injuries are common findings in paediatric patients, and they may have significant medical, dental and psychological consequences in the affected children.[1] One of such injury is entrapment of tongue within objects. Young children have been known to put their tongue in to many weird and dangerous objects. Tongue entrapment within such objects in not common.[2] There are very few reports of tongue injury from tongue entrapment in bottles[3,4] and can[5] in the literature. Thus, emergency medical personnel do not have established protocols for treating this life endangering occurrence.[6]

We are reporting a case of 9 years old male child with tongue haemangioma who had tongue entrapment within the neck of a plastic bottle.

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Case report

A 9 year old male child presented to emergency department of our hospital after getting his tongue stuck inside the neck of a plastic bottle due to vacuum effect. His parents made multiple attempts to remove it by traction but they couldn't remove it, instead it lead to further tongue oedema and tongue got trapped more firmly. (Fig. 1) Child was then taken to a nearby hospital where base of the bottle was cut and removed. However, they could not remove the bottle neck off the tongue. Due to further increase in tongue oedema, child was referred to our hospital for further management.

On examination, child was restless and crying in pain with excessive sweating and drooling. Vital signs were within normal limits. Child was not in respiratory distress. The anterior half of the tongue was trapped within the neck of a plastic bottle. It was massively oedematous and cyanotic. Immediately intravenous analgesic to relieve pain and intravenous hydrocortisone were given to reduce oedema.

Fig.1. The entrapped tongue

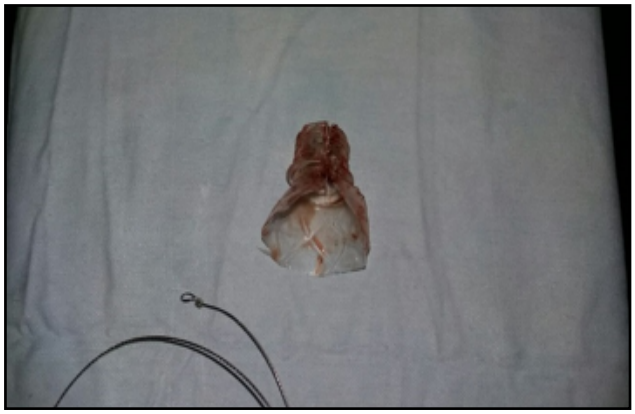

Fig. 2. The bottle-neck after removal

birth. Keeping this in mind, after holding the child, we made attempt to cut open the neck of the bottle with strong Mayo's scissors. But, Mayo's scissors could not cut through the neck of the bottle. As the oedema was increasing, we planned to take the child under intravenous sedation in the operation theatre. We planned to use a Gigli saw for sectioning the neck of the plastic bottle.

Child was shifted to operation theatre. His airway remained stable and spontaneous respiration was supported with oxygen via nasal prongs. Child was taken under intravenous sedation with ketamine and Glycopyrrolate. A Gigli saw wire taken and its one end passed under the neck of the bottle through the minimal space between tongue and neck of the bottle. In order to prevent trauma to the tongue from Gigli saw wire, a Bard Parker handle was inserted between the wire and tongue. The wire was attached to two Gigli saw handles and moved back and forth few times and bottle neck got sectioned in about 10 seconds. Gigli saw and Bard parker handle were removed. Two cut edges of the bottle neck were retracted apart and taken out with no trauma to the adjacent part of the tongue. (Fig. 2) Entire procedure took less than 10 minutes including sedation.

Anterior half of the tongue was massively oedematous. However, this returned to normal in 5-6 hours. Child was given intravenous dexamethasone, amoxicillin-clavulanic acid , analgesic and regular warm salt water gargles. Child observed in the ward for 24 hours and discharged on the next day.

Discussion

In injury to the tongue, the most common location is the dorsum of the anterior 1/3rd. [7,8] This is also the site in this reported case. The age of our patient is also within the commonly affected age group involved in oro-facial tissue injury. [7,9] The tongue on presentation was massively oedematous because of impaired venous return due to constriction by the neck of the plastic bottle. The tongue expands after it passes through the neck of the bottle, and when the child attempts to pull his or her tongue out, air is sucked in and a vacuum like seal farther confines the tongue inside the bottle. [2,6,4,10,11]

In this case we tried using conventional methods to cut open the bottle neck with scissors, but it was not possible to do so. So we planned to use a Gigli saw wire to section it. It took around 10 seconds to cut it with the wire. Hence it is a time saving method without any complications if performed correctly with proper assistance.

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Myxoid Chondrosarcoma of the Hyoid Bone

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ABSTRACT

Introduction

Chondrosarcoma of hyoid bone is very rare with only 19 cases still reported. We therefore, present this case report for the interest of medical literature to make clinicians aware of the disease.

Case Report

They usually present as a slow growing upper neck mass. Computed tomography (CT) and magnetic resonance imaging (MRI) are useful radiologic investigations. The tumour was resected through a trans-cervical approach. Definite diagnosis was made by postoperative histopathology and immunohistochemistry.

Discussion

Surgical excision is the treatment of choice for local control. Incomplete removal is a risk factor for recurrence and possible dedifferentiation. Long term follow up is necessary.

Keywords

Chondrosarcoma; Hyoid Bone; Immunohistochemistry

Chondrosarcoma is the third most common primary bone tumour accounting for 11% of all primary bone tumours,[1] after osteosarcoma and multiple myeloma.[2] Chondrosarcoma commonly occurs in pelvis, femur, humerus and ribs. Only in 1-12% cases,[1] it can be seen in head and neck region with skull base, maxilla and larynx being affected.

Chondrosarcoma of the hyoid bone is an extremely rare entity. We searched for published literature before June,2015 in MEDLINE and PubMed using the terms "chondrosarcoma" and "hyoid" which led to only 19 cases still reported. Here, we report a case of myxoid chondrosarcoma of hyoid bone along with its preoperative imaging studies, perioperative findings and postoperative complications, histopathology and immunohistochemistry.

Case report

A 50 years old gentleman presented to us with a slow growing, painless, firm, globular mass in upper neck in the midline which he first noticed 7 months back. The mass was adherent to underlying structures and moved with deglutition. (Fig.1)

He has a past history surgical excision of haemangioendothelioma of epiglottis three years ago. Neck was found to be clinically negative for lymph nodes. Fibre-optic laryngoscopy revealed normal laryngeal and hypopharyngeal subsites. CT Scan revealed a well demarcated peripherally enhancing hypodense lesion at base of the tongue extending to floor of the mouth involving the body and right greater cornu of the hyoid bone with thin enhancing septae within the lesion. No cervical lymphadenopathy was noted. (Fig.2)

T1 weighted post-contrast study in magnetic resonance angiography (MRA) showed irregular enhancing lesion involving floor of mouth on right side with oedema around it suggestive of vascular lesion with branches of external carotid artery appeared to drain the above areas

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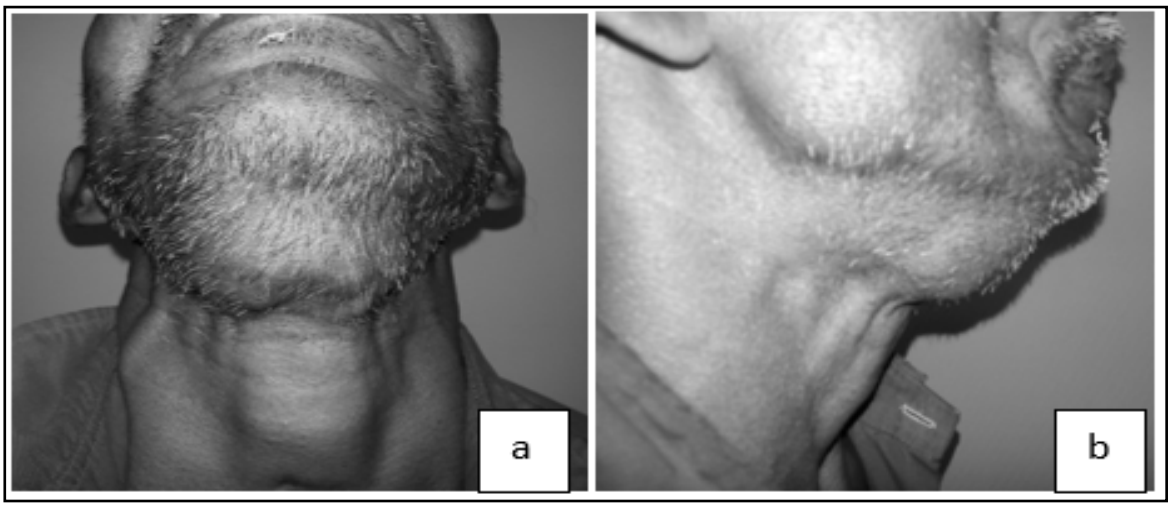

Fig. 1. Clinical presentation. a. Front view and b. Side view of the mass, 5cm x 3cm, situated in the upper neck in the midline, firm and non-tender on palpation

(Fig. 3)

Preoperative fine needle aspiration cytology (FNAC) showed atypical cells arranged mostly singly, also in clusters and ill formed papillae. Individual cells were round or oval to spindle with moderate amount of cytoplasm and hyperchromatic nucleus. Many of the cells were histiocytoid or epitheloid in appearance. Stromal fragments were seen in background. Overall cytomorphological picture suggested metastatic deposit of epiglottic haemangioendothelioma with an eye on the past operative history of the patient.

Surgical excision was planned via a trans-cervical route with upper crease neck incision. Tumour was found to be extensively attached to body and right greater cornu of the hyoid bone along with geniohyoid, mylohyoid, sternohyoid and thyrohyoid. Right hypoglossal nerve was found to be severely adhered to the tumour. Tumour dissected out in toto along with the body and right greater cornu of the hyoid bone. Right hypoglossal nerve was sacrificed for complete removal

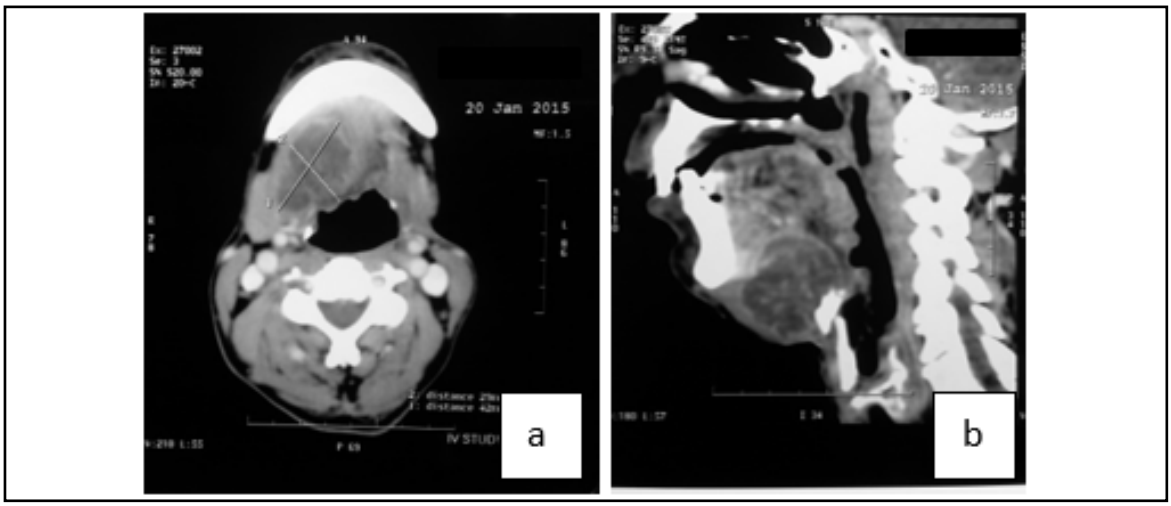

Fig. 2. Contrast enhanced computed tomography Axial cut (a) and Sagittal cut (b) showing a well marginated peripherally enhancing hypodense lesion measuring (3.6 x 4.2 x 3.7)cm with thin enhancing sepatae

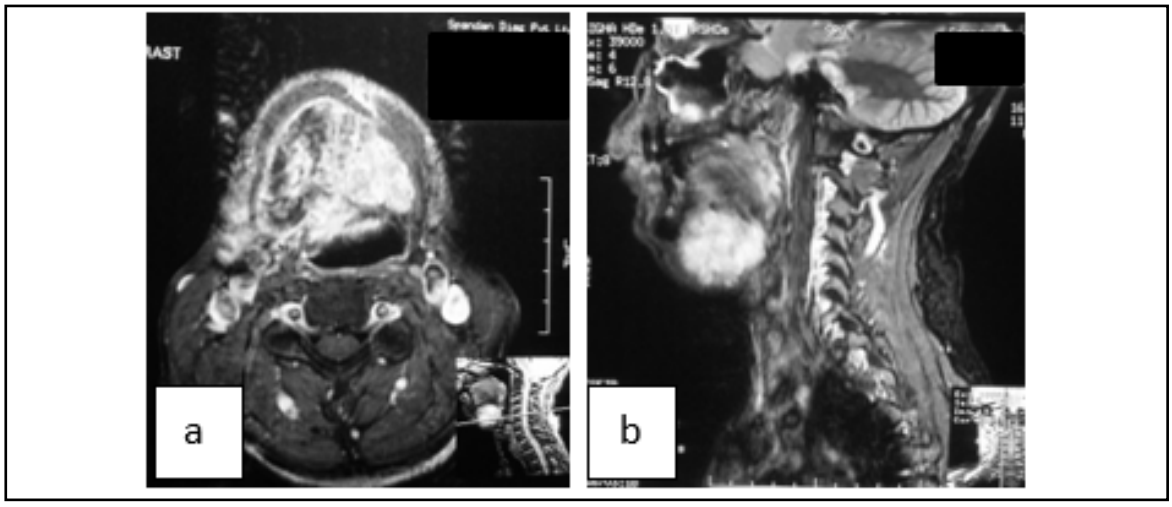

Fig. 3. Magnetic resonance imaging Axial cut (a) and Sagittal cut (b) T1 weighted post contrast study is showing irregular enhancing lesion slightly more on the right side with oedema around it. Lesion measures about 45mm in antero-posterior, 13mm in lateral and 36mm in cranio-caudal dimension.

of the tumour. Pharynx was not entered. (Fig. 4)

Post operatively patient developed right hypoglossal nerve palsy and dysphagia. No additional complication noted in one year follow-up.

Fig. 4. Surgical excision of the tumour along with body and right greater cornu of the hyoid bone.

Postoperative histopathology by examining Haematoxylin and Eosin, Periodic Acid Schiff and van Gieson stained sections revealed poorly differentiated sarcomatous lesion, presumably chondrosarcoma. Surgical margins were found to be clear of tumour. Subsequent immunohistochemistry showed the tumour to be immunoreactive (score 2+ in neoplastic cells) to S100 marker suggestive of myxoid chondrosarcoma.

No recurrence noted in one year follow-up.

Discussion

Chondrosarcoma is the third most common primary bone tumour, pelvis being the most common site of occurrence. Chondrosarcoma arising in head and neck region is rare. A review by National Cancer Database (NCDB) in the United States identified 400 cases of head and neck chondrosarcoma in a ten year period from 1985 to 1995.[1] But chondrosarcoma of hyoid is very rare with only 19 cases still reported in international literature.

From the NCDB report, the average age of patients with chondrosarcoma of the head and neck region is 51 years,[3] which very well correlates with our case. There is slight male predominance and ethnicity reveals that non-Hispanic white constitutes more than

86% of cases.[4] Only a small percentage of cases with regional and distant metastases at diagnosis with 5.6% and 6.7%, respectively, are found in the NCDB report.[5] On the whole, it is a low-grade, slow-growing type of sarcoma. It frequently presents as a painless mass originating either within the bone or outside the bone. From this, these tumours are typically classified as osseous and extraosseous ones, which can be graded from one to three based on the histological appearance,[6] with grade 3 bearing the worst prognosis. In our case, the tumour fell in grade 2 category consistent with myxoid chondrosarcoma. Rarely, a chondrosarcoma will dedifferentiate to a high-grade spindle cell sarcoma with a very bad prognosis.[7] So a long term follow up of these patients is necessary.

Generally, the most appropriate imaging modality in a case of chondrosarcoma is CT scan to detect bone destruction. Intra-mural calcification may be noted in 75% of the cases.[8,9] MRI is useful to detect surrounding soft tissue invasion. Signal intensity is low in T1 weighted image and high in T2 images, with signal void in calcified areas. A typical mosaic pattern is seen in high intensity T2 images.[10] In our case, although CT scan revealed no intra-mural calcification, thin enhancing septae were seen within the lesion. MRA gave additional information about possibility of branches of external carotid artery draining the area. Preoperative FNAC, though, did not produce any valuable information.

Treatment is by surgical excision followed by reconstruction, if necessary. Clear margins of excision are absolutely essential for local control.[11,12] Although consideration of adjuvant radiotherapy may be entertained, particularly in high-grade tumours.

Postoperatively the patient has right hypoglossal nerve palsy and complaint of dysphagia. Histopathological examination revealed a poorly differentiated sarcomatous lesion. Subsequently, immunohistochemistry was carried out using CD31 and S100 markers. CD31 was found to be non-immunoreactive (score 0 in neoplastic cells) ruling out Ewing sarcoma.[13] Whereas, 26-50% of neoplastic cells were found to be immunoreactive to S100 (score 2+), consistent with myxoid chondrosarcoma.

The NCDB report, reveals a surprisingly high survival of head and neck chondrosarcoma at 87.2% five-year and 70.6% ten-year survival, with 59.5% undergoing surgery alone and 21% having adjuvant radiotherapy.

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Isolated Sphenoid Sinus Disease- A Unique Case of Sphenoidal Mucocoele

Tushar Kanti Ghosh,[1] Srijoy Gupta, [1] Pradeep Devineni [1]

ABSTRACT

Introduction

Isolated Sphenoid Sinusitis and sinus lesions is a rare entity accounting for just 1-3% of all sinus afflictions. Most occur in men in the third or fourth decade of life.

Case Report

A case of right sphenoid sinus mucocele is reported in a male patient aged 68 years, with size of the lesion (35 x 34 mm) detected by CT & MRI scans. The patient presented with a 3 weeks history of unilateral ptosis, diplopia, and photophobia. He also complained of bilateral nasal obstruction, nasal stuffiness, and a mucoid nasal discharge. Endoscopic decompression of the right sphenoid sinus was performed, and approximately 160 ml of thick mucoid secretion was aspirated. Despite the size of the mucocele, no significant destruction of the sphenoid walls was evident. Postoperatively within 15 days the patient's symptoms improved significantly.

Conclusion

The Nasal Endoscope has revolutionised sphenoid sinus mucocele treatment. An adequate sphenoidotomy and drainage give excellent results.

Keywords

Mucocele; Sphenoid Sinus; Ophthalmoplegia

Isolated sphenoid sinus mucocele is mainly inflammatory in origin with neoplasms being rare. Isolated sphenoid sinusitis accounts for 1-2% of all sinus infections.[1] Mucoceles are defined as an accumulation and retention of mucus within a sinus as a result of an obstructed outlet.[2] When the contents are purulent, the condition is referred to as pyocele.[2] Posterior ethmoid and sphenoid sinus mucoceles and pyoceles can present with orbital complications such as superior orbital fissure syndrome or orbital apex syndrome requiring urgent drainage and evacuation. Rarely intracranial extension has also been reported.[3]

Case Report

A 68 years of age, male presented to us with a 3 week history of unilateral ptosis, diplopia and photophobia which was worsening. It was associated with nasal obstruction, nasal stuffiness and a mucoid discharge from nose which had been going on intermittently for more than a year. A mild DNS to the left side was found in the clinical examination of the patient along with signs of right Oculomotor (3rd cranial nerve) palsy (Fig. 1), ptosis (due to weakness of levator palpebrae), diplopia (due to weakness of the extra ocular muscles supplied by the 3rd nerve) and photophobia (due to defective parasympathetic pupillary innervation). Nasal endoscopy showed thick purulent discharge from the right superior meatus region along with a deviated nasal septum to left.

CT scan was suggestive of isolated sphenoid sinusitis. (Fig. 2) Bony septum and roof appeared intact. MRI scan was suggestive of a dilated sphenoid sinus with thick fluid collection inside indicating a sphenoid mucocele. (Fig. 3) It measured about 3.5 x 3.4 cm in size. It appeared to be compressing the structures near the right orbital apex.

All the routine investigations were within normal limits for the patient.

The patient underwent endoscopic sinus surgery

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Fig. 1.Patient with 3rd cranial nerve palsy

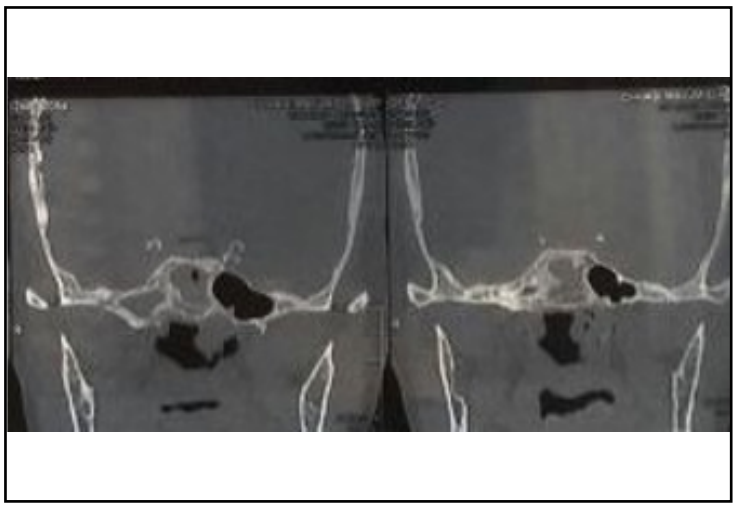

Fig. 2. CT scan suggestive of Sphenoid lesion

under general anaesthesia and right sphenoid sinus was opened. A mucocele was found in the sinus. It was punctured and thick muco-purulent discharge was drained. The wall of the mucocele was removed. The right sphenoid sinus was thoroughly cleaned.

The patient's post-operative course was uneventful and he was started on broad spectrum antibiotics, decongestants and systemic steroids. The biopsy report of the tissue removed was sent for histopathological examination and showed to be sino-nasal mucosa with inflammatory changes. The orbital symptoms of the patients gradually improved and resolved completely within 15 days. (Fig. 4)

Discussion

Isolated sphenoid sinus lesions are rare occurring in just 2 to 3 % of all paranasal sinus lesions.[4] They include mucoceles, pyoceles and isolated mycotic infections. The sphenoid sinus is roughly involved in about 16% cases of chronic sinusitis.[5] A sinus mucocele is defined as a mucous collection lined by the mucous secreting

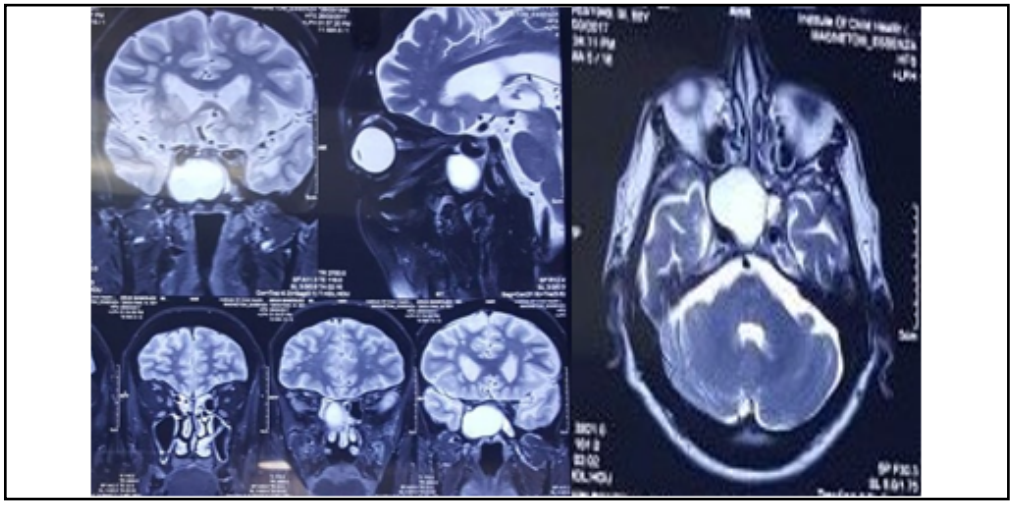

Fig. 3.MRI indicating sphenoid mucocele

Fig. 4. Ophthalmoplegia improved within 15 days

epithelium of a paranasal sinus, occurring when a sinus ostium or a compartment of a septated sinus becomes obstructed. The obstruction is usually inflammatory in nature with tumour, trauma or surgery being the other causes. A pyocele is formed by the secondary infection of a mucocele. Skillern set forth several criteria for differentiating mucoceles from pyoceles, which include rate of growth, inflammatory symptoms, tenderness, consistency on palpation, severity of orbital symptoms, characteristics of contents of the cyst and the finding of pathogenic organisms on culture of this material.[6]

Clinically the most prominent findings are headache and a variable amount of secretion discharged through the sphenoid recess into the nasopharynx.[7] However, orbital complications are not unheard of 3 but rare especially in this day and age, with features of unilateral proptosis, decreased vision, diplopia, and photophobia seen in the patient.[8] Due to these symptoms, the patient often presents to the ophthalmologist as in our case prior to reporting to the ENT surgeon, affirming the need to have a good understanding of the disease among the ophthalmologists.

The clinical manifestations are variable and related to the direction of extension towards neighbouring structures. The most common clinical symptom is headache which is present in 70-80% of cases.[9] This is typically retro-orbital. Visual disturbance is the second commonest group of symptoms making surgery necessary.[10] The optic nerve is the most frequently involved cranial nerve with reduction in visual acuity. Palsy of eye movement with diplopia occur in 30-50% of cases.[11] The oculomotor nerve is affected more frequently than the trochlear and abducens nerve as in our case. Oculomotor nerve involvement accounted for 70% of ocular palsies.[11]

Although sphenoid sinus mucocele is pathologically benign, it may involve many vital structures, including the dura, pituitary gland, optic nerve, cavernous sinus, internal carotid artery and cranial nerves (oculomotor, trochlear, trigeminal and abducent nerves) which are vulnerable to injury from the sphenoid lesion. Complications include diplopia, blindness, meningitis, cavernous sinus thrombosis and the compression of the internal carotid artery.[12] This makes it essential to have an MRI done along with the CT scan as was done in our case to effectively manage the disease as urgently as possible.

Role of CT and MRI is paramount to the diagnosis of the Sphenoid mucoceles. The CT scan shows the affected sinus is completely opacified and the margins are expanded and usually thinned.[13] Areas of complete bone resorption may be present, resulting in bony defect and extension of the 'mass' into adjacent tissues. Peripheral calcification is sometimes seen. Following administration of contrast, only peripheral enhancement (if any) is seen. The content of the sinus is variable, depending on the degree of hydration, ranging from near-water attenuation to hyperattenuating as secretions become increasingly thick and desiccated

MRI signal intensity is highly variable and depends on the proportions of water, mucus and protein 13:

T1 weighted images:

- o water rich content: low signal (most common)
- o protein rich content: high signal

T2 weighted images:

- o water rich content: high signal (most common)
- o protein rich content: low signal

MRI features in our case were suggestive of a rich protein content mucocele, compressing the structures near the right Orbital apex. Optic nerves, optic chiasm and retro-bulbar fat cones were normal.

The recommended treatment of most mucoceles and pyoceles is surgical drainage by endoscopic sinus surgery.[1,2,3] The sinus outflow tracts are preserved with minimal alteration of the anatomical architecture.

Not many cases have intracranial extension with the walls of the mucoele in most cases remaining intact.[8,14] Even with intra cranial extension, ophthalmologic signs and symptoms may be absent and can be treated effectively with the nasal endoscope.[4]

Proper and timely treatment usually results in rapid regression of the ophthalmic manifestation, but vision seldom returns to normal in the case of visual dysfunction due to optic nerve compression with vascular compromise or extension of the sinus infection and inflammation to the optic nerve. A delay in surgery of more than seven to ten days after the onset of visual dysfunction is often associated with poor visual prognosis.[15] Thus, the appropriate diagnosis must be made early,[16] with rapid intervention to achieve good results and restoration of adequate eye movements. However El Mograbi[17] noted that, there was resolution of ophthalmoplegia even when the intervention had occurred 2 months after the onset of visual problems, hence making it imperative to act whenever the patient presents to us.

Conclusion

The sphenoidal mucocele, though a rare entity which needs to be diagnosed and managed at the earliest. Patients with headache or other features of sinusitis associated with ophthalmic manifestations require an urgent diagnostic imaging (CT scan nose and paranasal sinuses with or without MRI) and the involvement of the Otorhinolaryngologist in the management of the disease. Nasal endoscopes have revolutionised and simplified the treatment of the sphenoidal mucocle with an adequate sphenoidotomy and drainage giving excellent results. Resolution of ophthalmoplegia is excellently achieved with the surgical procedure itself.

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Tracheal Stenosis After Endotracheal Intubation and Percutaneous Dilatational Tracheostomy

Camelia Herdini,[1] Agus Surono,[1] Supomo Supomo,[2] Jessica Fedriana[1]

ABSTRACT

Introduction

Tracheal stenosis is an abnormal narrowing of the tracheal lumen which affects adequate airflow and caused by an inflammatory complication such as endotracheal intubation and percutaneous dilatational tracheostomy (PDT). Incidence of tracheal stenosis following endotracheal intubation and PDT was 8-44%.

Case Report

A 24 year old female presented with dyspnea and hoarseness after traffic accident. She was intubated for 2 weeks then followed by PDT for 3 weeks. The laryngoscopy examination after PDT extubation showed tracheal stenosis at the second-third tracheal ring with left vocal fold granuloma. Cervical computed tomography demonstrated a mass at vocal cord and narrowing of tracheal caliber at the first thoracic vertebra disk, above the stoma of PDT.The granuloma was excised and tracheal stenosis was removed by tracheal resectionand end-to-end anastomosis.

Discussion

Tracheal stenosis is one of important sequelae after endotracheal intubationand PDT. Tracheal resection and primary anastomosis may be considered as an option for surgical management of tracheal stenosis.

Keywords

Tracheal Stenosis

Tracheal stenosis is an abnormal narrowing of the tracheal lumen which can compromise airflow. It is caused by prolonged intubation or tracheostomy, and is complex and difficult to manage.[1] Oral or nasal endotracheal tubes or tracheostomy tubes are commonly used to render mechanical ventilatory support in respiratory failure.[2] Despite technological improvements and skillful patient care in intensive care units, laryngotracheal stenosis continues to be common after intubation and tracheostomy.[2,3] In some cases, tracheal stenosis may occur below the cuff of the tube and above the stoma.[3]

Incidence of tracheal stenosis following endotracheal intubation and percutaneous dilatational tracheostomy (PDT) is difficult to quantify. It has been reported to be 8-44% by various authors, whereas incidence of symptomatic tracheal stenosis with more than 50% tracheal narrowing was 2-6%.[4-6] The management involves a multidisciplinary approach with multiple complex procedures.[1]

Case Report

A 24 year old female presented to Dr. Sardjito Hospital in Yogyakarta, Indonesia for evaluation of dyspnea and hoarseness. The patient was treated in intensive care unit following a road traffic accident 3 months back. She was on endotracheal intubation for 2 weeks. Then she underwent a percutaneous dilatational tracheostomy (PDT) and was on tracheostomy for 3 weeks. Two weeks after decannulation, she experienced dyspnoea on exertion and a persistent change in her voice. The initial direct flexible laryngoscopy examination revealed a solitary, round smooth, pedunculated mass in left posterior larynx, which was a suspected vocal fold

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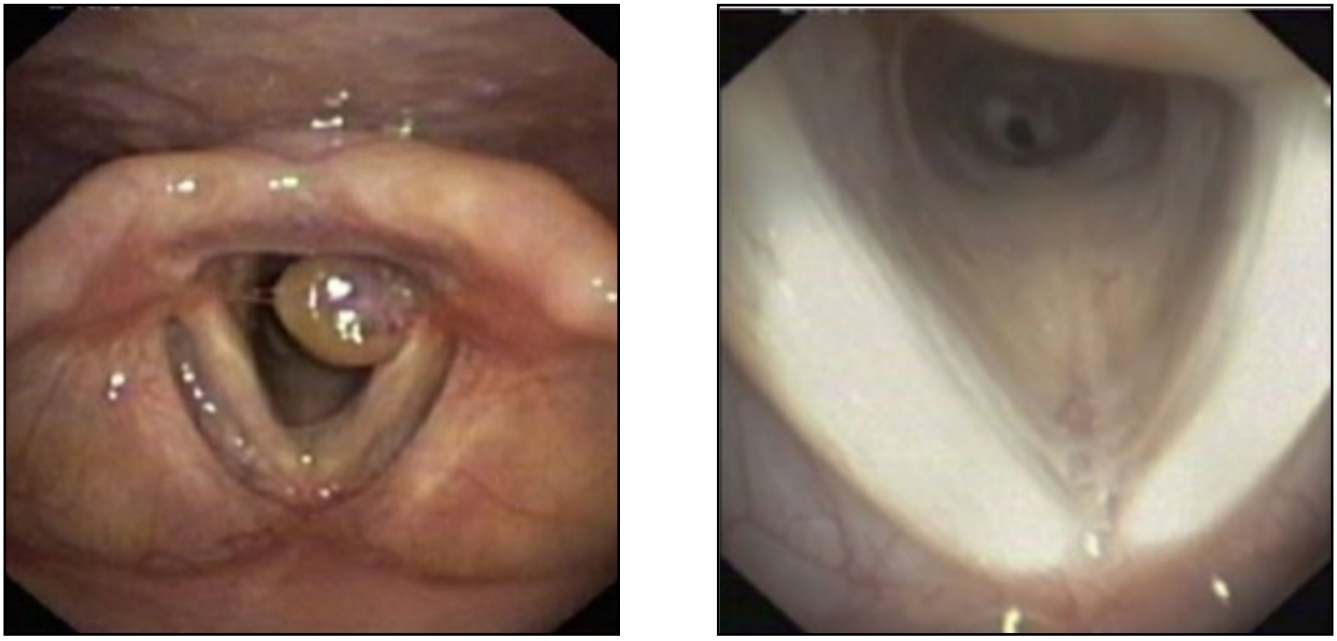

Fig. 1 Initial examination of flexible laryngoscopy. (A) Vocal fold granuloma and (B) tracheal stenosis.

granuloma. Below that mass, there was tracheal stenosis as high as the second-third tracheal ring (Fig. 1). The movement of the vocal folds were relatively normal. There was a surgical scar in the neck and no palpable cervical lymphadenopathy. The patient did not have respiratory distress.

Multi-slice computed tomography (MSCT) of neck demonstrated a narrowing of tracheal calibre as high as the first thoracic vertebra disk with diameter 0.77 cm. Diameter of the proximal normal segment was 1.37 cm (the stenosis was 56% of the tracheal diameter). There was a stoma of PDT on anterior tracheal wall as high as second thoracic vertebra corpus (Fig. 2).

Clinical history, physical examination, and imaging

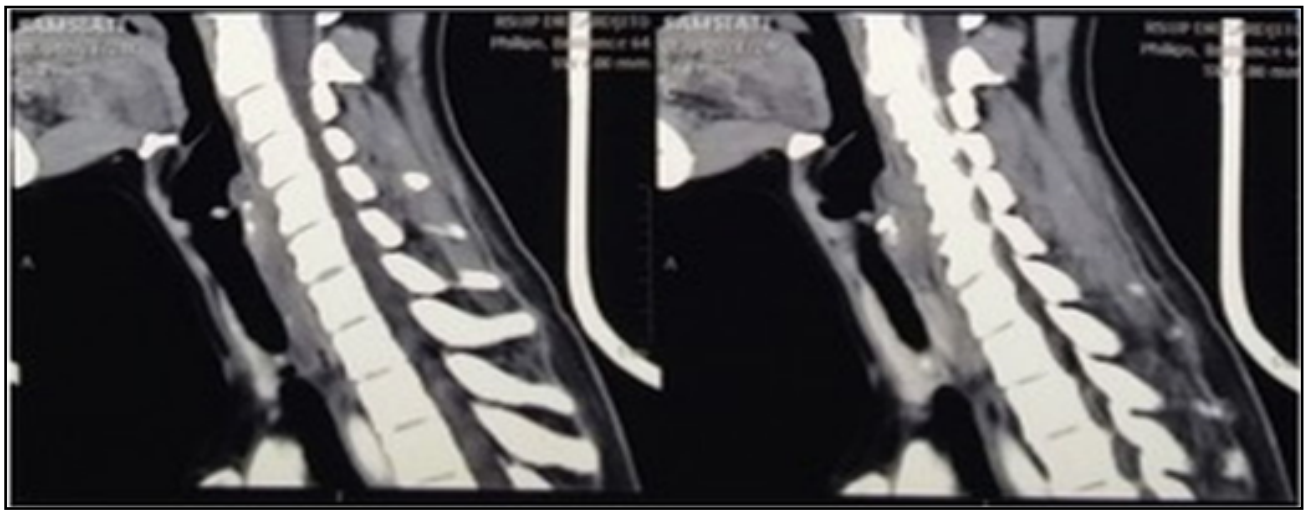

Fig. 2 Multi-slice computed tomography of the cervical. The tracheal stenosis was shown as high as the first thoracic vertebra corpus.

refer to the diagnosis of tracheal stenosis. The management was resection of the trachea followed by end-to-end anastomosis under general anesthesia. The stenosed second and third tracheal rings were removed. Post operatively, she was on endotracheal intubation for 10 days and was given antibiotics, analgesics, steroids, and proton pump inhibitors. After extubation, she was completely relieved from dyspnea and hoarseness. Post operative flexible laryngo-tracheoscopy revelead shrunken vocal fold granuloma and patent tracheal airway with normal vocal fold movements. 3 months post operatively, the patient remained symptom-free (Fig. 3).

Discussion

Tracheal stenosis is an abnormal narrowing of the tracheal lumen. It begins with trauma and ulceration of tracheal mucosa with superimposed local infection, leading to perichondritis of tracheal cartilage followed by increased fibroblastic activity leading to circumferential scarring and airway obstruction.[1] Another postulated causative factor for stenosis is loss or reduction of regional blood flow due to the pressure exerted by the cuff on the tracheal wall.[7] The infectious process also leads to formation of granulation tissue that contributes to scarring. Long-term intubation and tracheostomy account for the majority of benign but potentially hazardous tracheal stenosis.[4]

Fig. 3 Examination of direct flexible laryngoscopy after three months of surgery.

Tracheostomy was originally used strictly for the emergency management of upper-airway obstruction and was therefore associated with a high incidence of serious complications. More recently, it has become an elective procedure intended to improve clearance of secretions and prevent the complications associated with prolonged endotracheal intubation in ventilator dependant or critically ill patients.[4] Complications of open tracheostomy are more than those of percutaneous procedures, but percutaneous tracheostomy procedures are also associated with some dreaded complications. To prevent cartilage damage, particularly during percutaneous tracheostomy, excessive force must not be applied to the trachea, and the placement of the stoma must be guided by bronchoscopy. Some centres prefer open tracheostomy.[8]

Post intubation stenosis is generally longer and uniform compared to post tracheostomy stenosis which is generally an extension of granulation tissue from the injured anterior wall of the trachea.[1] The common sites of tracheal stenosis post tracheostomy are the stoma, the supra stomal area, and the cuff site.[9] In this patient, tracheal stenosis occurred at the supra stomal area at the second and the third tracheal ring. The tracheal stenosis was 56% of the tracheal diameter.[10]

Although stenosis generally develops within two to three months of decannulation, it can occur as early as two to six weeks. The symptoms of a functionally significant stenosis include dyspnoea on exertion, cough, or inability to clear secretions. Symptoms of stenosis at rest are unusual until at least 75% of the diameter of the trachea has been obstructed. Critical narrowing with stridor does not occur until the diameter of the tracheal lumen is less than five to six mm.[4] This patient experienced dyspnoea on exertion and a persistent change of voice without stridor two weeks after decannulation from PDT.

There are two basic modalities available for treatment of tracheal stenosis, namely endoscopic and external

(open) surgery. The endoscopic approach includes traditional dilation, laryngeal microsurgery, laser-assisted excision, and endoscopic stent placement.[11] Endoscopic dilation should be reserved for patients with significant comorbidities or as a temporary measure in non-equipped centres.[7] External surgical reconstruction includes tracheal resection and anastomosis, laryngotracheoplasty, pericardial patch tracheoplasty, slide tracheoplasty, homograft tracheal transplantation, and autologous reconstructed trachea.[12] Open surgery is recommended for patients with complex stenosis or restenosis after multiple procedures and those in conjunction with associated conditions like tracheoesophageal fistula closure. Contraindications are long segment involvement (more than 50%), multiple focal involvement, and poor surgical condition.[1]

Resection of the stenosed segment of trachea followed by end-to-end anastomosis has become the standard of care in many centres and has given the most consistent results. It is indicated for tracheal stenosis involving less than two-thirds of tracheal length.[12,13] Post-operatively broad spectrum antibiotics are usually required to prevent local infection and wound breakdown. Antireflux therapy is also needed to protect the airway. In addition, corticosteroids are recommended in the first 48-72 hours, but they should not be used longer since they may impair healing. Maintaining neck flexion is necessary to prevent suture line disruption. Patient is followed up endoscopically four to six weeks post operatively to check suture lines.[12] This patient was given antibiotics, analgesics, steroids, and proton pump inhibitors.

According to the literature, the success rate ranges from 71 to 97%,[8] with 1.8 to 5% mortality rate and 5 to15% failure rate.[14] Staged reconstructions were needed in 26% of the patients. Older patients aged more than 60 years and patients with a higher grade of stenosis showed a significantly lower success rate. Staged operations were more frequently needed in cases with total stenosis and with combined stenosis of the trachea and the subglottis.[14] Complications of open surgery include vocal cord palsy, restenosis, suture granuloma formation, and infection.[1] This patient was relieved from dyspnea and hoarseness, without any complication. In conclusion, tracheal stenosis is an important sequel of endotracheal intubation and percutaneous tracheostomy procedures. Tracheal resection and primary anastomosis is a first-line treatment for tracheal stenosis. Collaboration is needed between thoracic and ENT surgeons to develop protocols for management of tracheal stenosis.

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